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CONSPECTUS OF THE ORDERS CONTAINED IN THE SEVENTH VOLUME.

Class II. **MONOCOTYLEDONS.**

(Continued from Vol. VI.)

** *Ovary superior.*

Series I. Coronariæ.—*Perianth more or less distinctly 2-seriate. Ovary syncarpous (except a few Palms). Seeds albuminous.*

† *Perianth-segments all petal-like or membranous and coloured.*

CXXVI. Roxburghiaceæ. Perianth-segments 2 in each series. Stamens 4.

CXXVII. Liliaceæ. Perianth-segments or lobes 3 in each series. Stamens 6 or fewer. Terrestrial herbs or climbers or arborescent.

CXXVIII. Pontederaceæ. Aquatic herbs with slightly irregular flowers, otherwise as in Liliaceæ.

†† *Inner perianth-segments petal-like, outer ones calyx-like or wanting.*

CXXIX. Philydraceæ. Inner perianth of 2 broad petals, outer deficient. Stamen 1 perfect, 2 staminodia.

CXXX. Xyrideæ. Outer perianth of 1 deciduous hyaline or scarious segment; inner of 3 petal-like segments. Stamens 3 perfect, staminodia 3 or none.

CXXXI. Commelynaceæ. Outer perianth of 3 thin or herbaceous segments, inner of 3 equal or unequal petal-like segments. Stamens 6 or fewer perfect, when fewer replaced by staminodia.

††† *Perianth-segments all calyx-like (rarely coloured and small).*

CXXXII. Juncaceæ. Stems rarely arborescent. No spatha.

CXXXIII. Palmæ. Stems usually arborescent, or climbing and woody. Young inflorescence enclosed in a spatha.

Series II. Nudifloræ.—*Perianth of small scales or none (except some* Alismaceæ). *Ovary apocarpous or monocarpillary (except a few* Aroideæ *and* Pandaneæ).

CXXXIV. Pandaneæ. Flowers closely packed in dense spikes or heads with a bract at the base, diœcious. No perianth. Stamens in the males covering the rhachis Ovaries sessile often connate. Stem arborescent with leaves in a spire, or climbing and leafy.

CXXXV. Aroideæ. Flowers closely packed in a dense simple spike with a spatha at the base, unisexual or hermaphrodite. Fruit baccate. Seeds albuminous or in a few genera without albumen.

CXXXVI. Typhaceæ. Flowers closely packed in dense simple spikes or heads, the upper one or more male, the lower one or more female. Fruit-carpels small dry or drupaceous. Seeds albuminous. Tall semi-aquatic herbs.

CXXXVII. Lemnaceæ. Small floating green scale-like fronds without stems or leaves. Flowers and fruits minute on the edge or upper surface of the fronds. Seeds with or without albumen.

CXXXVIII. Naiadeæ. Aquatic or rarely marsh plants. Flowers solitary or loosely spicate. Fruit of small carpels or rarely capsular. No albumen.

CXXXIX. Alismaceæ. Aquatic or marsh plants. Flowers spicate or paniculate. Inner perianth of 3 or 2 petals, outer membranous or deficient. Ovary apocarpous. No albumen.

Series III. Glumales.—*Flowers sessile within imbricate bracts or glumes, in heads or spikelets. Perianth none or scarious or glume-like and usually concealed within the bracts. Ovary* 1-*ovulate or with* 1-*ovulate cells. Seeds albuminous.*

CXL. Eriocauleæ. Flowers unisexual in heads usually androgynous. Perianth-segments 6 or fewer, small and scarious or hyaline. Ovary 3- or 2-celled; ovules pendulous.

CXLI. Centrolepideæ. Flowers hermaphrodite or polygamous. No perianth. Stamen 1. Ovary of 1 or 2 or more cells; ovule pendulous. Small tufted plants.

CXLII. Restiaceæ. Flowers usually unisexual. Perianth of 6 rarely fewer glume-like segments usually exceedingly the bracts. Stamens 3. Ovary 1- 2- or 3-celled, ovule pendulous. Habit of Junceæ or Cyperaceæ. Leaf-sheaths with free margins.

CXLIII. Cyperaceæ. Flowers hermaphrodite or unisexual. Perianth none or of small scales or bristles concealed within the bracts, very rarely of 6 glume-like segments. Stamens various. Ovary 1-celled; ovule erect. Leaf-sheaths with the margins connate.

CXLIV. Gramineæ. Flowers hermaphrodite or unisexual. Perianth none. Stamens various. Style-branches usually feathery. Ovary 1-celled, ovule erect. Leaf-sheaths with free margins.

Class III. CRYPTOGAMÆ.

No real flowers. Fructification (in the Orders here included) consisting of spore-cases enclosing spores.

CXLV. Lycopodiaceæ. Spore-cases sessile in the axils of radical or cauline leaves or bracts.

CXLVI. Marsileaceæ. No true leaves. Fronds circinnate in vernation; barren ones linear or with a leaflike lamina, fertile ones forming an utricle or closed involucre including the spore-cases.

CXLVII. Filices. No true leaves. Fronds circinnate in vernation (except in *Ophioglosseæ*), the fertile ones bearing the spore-cases on their under surface or margins.

The remaining Order of Vascular Cryptogams, *Equisetaceæ*, is not represented in Australia, and Cellular Cryptogams are not included in the present work.

FLORA AUSTRALIENSIS.

ORDER CXXVI. ROXBURGHIACEÆ.

Flowers hermaphrodite, regular. Perianth inferior, of 4 deciduous segments, all nearly equal and similar, imbricate in 2 rows. Stamens 4, almost hypogynous; filaments very short, free or united in a ring; anthers erect, with 2 cells opening laterally or inwards in longitudinal slits. Ovary free, 1-celled; ovules several, either erect from the base or suspended from the apex of the cavity; stigma terminal, sessile. Fruit a capsule, opening in 2 valves. Seeds several, the funicle bearing as a strophiole a dense tuft of hairs or long linear papillæ; testa striate. Embryo linear or small, in a fleshy albumen.—Erect herbs or tall twiners. Leaves alternate opposite or verticillate, petiolate, with distant primary veins and transverse veinlets. Flowers 2 or more together on slender pedicels, in axillary clusters or short racemes.

Besides the typical genus, the order contains one other one from Japan.

1. ROXBURGHIA, Jones.

Perianth-segments several-nerved, lanceolate, acuminate. Filaments more or less united in a ring; anthers long-linear, the thickened connective produced into a long linear erect appendage. Ovules erect from the base of the ovary. Tall twiners, woody at the base. Flowers large or moderate-sized.

The genus comprises very few species, extending from Australia to Japan.

1. **R. javanica,** *Kunth, Enum.* v. 288, var. ? *Australiana.*—A glabrous twiner. Leaves alternate, from ovate to lanceolate, acutely acuminate, rounded truncate or shortly tapering at the base, mostly 3 to 4 in. long, on very short petioles, 5-nerved or when very narrow 3-nerved, with very numerous fine parallel transverse veinlets. Flowers 2 together in the axils, on filiform pedicels of 6 to 9 lines articulate above the middle, with a small lanceolate bract at their base. Perianth-segments narrow-

lanceolate, acute, 5-nerved, about ½-in. long. Filaments united in a short cup round the ovary. Anthers including the appendage nearly as long as the perianth, the connective thickened and rugose both at the back and in front between the narrow linear lateral cells, and produced beyond them into a long smooth linear appendage. Ovary ovoid, contracted at the end, with a very obtuse sessile stigma. Ovules not numerous. Fruit not seen.

N. Australia. Port Essington, *Armstrong.*
Queensland. Endeavour River, *Banks and Solander* (if correctly determined).

The Port Essington specimens agree with *P. javanica* in their alternate leaves and small flowers with narrow segments, and their segments are 5-nerved as described by Kunth, whilst in Teijsmann's Java specimens they are at least 7-nerved, and the flowers are only two together instead of several in a cluster. The leaves are not cordate, whilst Kunth describes them as deeply cordate, but in Teijsmann's specimens they are scarcely so. Banks and Solander's specimen is in leaf only, and was doubtfully referred by Brown to *Dioscorea* as *D. lucida*, Br. Prod. 295. It shows, however, the remarkable venation of *Roxburghia*, and is probably a form of *R. javanica*; the leaves (only the lower ones shown on the specimen) are broad, somewhat cordate, and 9-nerved.

ORDER CXXVII. LILIACEÆ.

Flowers hermaphrodite or rarely more or less diœcious, regular or rarely slightly oblique. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured or petal-like lobes or segments, imbricate in 2 series or the outer ones rarely valvate; all equal and similar, or the 3 inner ones rather larger or smaller or more united or occasionally broader and thinner than the 3 outer. Stamens usually 6, attached to the base of the lobes or segments or almost, rarely quite, hypogynous, or rarely slightly perigynous, the 3 opposite the outer segments often smaller, and in a few genera reduced to staminodia or deficient; filaments free or shortly united at the base; anthers erect or versatile, with 2 parallel cells opening inwards or laterally or rarely outwards, or by terminal pores. Ovary superior, 3-celled (imperfectly so in *Astelia*), with several often numerous, rarely only 1 or 2, ovules in each cell, amphitropous anatropous or rarely orthotropous, attached to an axile placenta. Style usually single with a small terminal stigma entire or obscurely 3-lobed, or in a few genera divided to the base or nearly so into 3 oblong or linear diverging or recurved stigmatic branches. Fruit either an indehiscent berry, or a capsule loculicidally or in a few genera septicidally opening in 3 membranous coriaceous or slightly fleshy valves, or rarely dividing into 3 indehiscent 1-seeded nutlets, in a few species reduced by abortion to 1 cell or nutlet. Seeds various, the testa frequently black, crustaceous or thin and adnate. Embryo small or linear, variously placed within a fleshy cartilaginous or hard albumen.—Perennial or rarely annual herbs with a short or tuberous or creeping rhizome, or (in genera not Australian) a bulbous base, or the stock growing up into a woody caudex, or the stems elongated branching shrubby or even arborescent or occasionally climbing. Leaves most frequently in radical

tufts, or crowded at the ends of the caudex or branches, but sometimes spread along the branches, their sheathing bases distichous, or variously imbricated, or scattered, and often persistent after the blade has fallen away, the blade or lamina entire or minutely scabrous-denticulate, usually narrow with parallel veins, flat channelled or terete, rarely broad with distant primary veins and transverse veinlets. Scapes or flowering stems or peduncles terminal or rarely axillary, leafless or with 1 or 2 leaves below the inflorescence smaller than the lower ones, and passing into the bracts under the branches of the inflorescence or pedicels, which are usually reduced to small scales, and sometimes entirely wanting. Inflorescence variously branched or simple, usually centripetal, or reduced to a single terminal flower. Perianth usually glabrous, very variously coloured, often blue, as well as red, white, yellow, or purple.

The Order, like the *Amaryllideæ*, is generally distributed over the warmer and temperate regions of the globe; most abundant in dry sunny countries. Of the 40 genera here included, 4 are large genera widely distributed over the warmer regions of the Old World, more or less represented also in America, and 2 of them extending into more temperate regions; 3, although chiefly Australian, extend into tropical Asia, and two of them also to New Zealand; 4 are Australian representatives of South African genera, one of them extending into tropical Asia; 2, chiefly Australian, are also found in New Zealand or in the Pacific Islands; 2 belong to the New Zealand and Tasmanian alpine flora, 1 of them widely distributed over the extreme southern regions of the new as well as the old world; the remaining 24 are, as far as hitherto known, strictly endemic, a large proportion of them, however, consisting of only one or two species.

In working up this complicated and at first sight heterogeneous Order, I have been greatly assisted by Mr. Baker, whose views as to its comprehensiveness, as given in the series of monographs he is publishing in the Journal of the Linnean Society, I have mainly followed. The tribes and subtribes, however, which I have here characterised, are chiefly with reference to the Australian genera, a large proportion of which are strictly or nearly endemic, and would probably require a somewhat different arrangement in a general system of the whole Order, the limits of which are far from being definitively settled. Many botanists would distribute these Australian genera into 6 or 7 distinct Orders, whilst on the other hand the characters which separate them from *Junceæ* are by no means without exception. Generally speaking, they differ from *Amaryllideæ* in their free ovary, and from *Junceæ* by the petal-like consistency of both series of the perianth and with very few exceptions by the seeds.

SERIES I. **Baccatæ.**—*Fruit succulent or fleshy, indehiscent or rarely opening tardily in 3 valves.*

TRIBE I. **Smilaceæ.**—*Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo distant from the hilum. Albumen hard. Branching climbers. Leaves with distant primary veins, and transverse veinlets.*

Flowers diœcious, in sessile or pedunculate umbels . . . . 1. SMILAX.

Flowers hermaphrodite, in racemes either simple and axillary or terminal and paniculate . . . . 2. RHIPOGONUM.

TRIBE II. **Flagellarieæ.**—*Perianth-stamens, style and embryo of* Smilaceæ. *Albumen mealy. Leaf veins all parallel and numerous.*

Flowers hermaphrodite. Climbers. Leaves ending in a twisted point . . . . 3. FLAGELLARIA.

TRIBE III. **Astelieæ.**—*Perianth-segments distinct, spreading. Anthers erect. Styles or stigmas very short, distinct. Tufted herbs. Leaf-veins parallel.*

Flowers diœcious, in terminal racemes or panicles . . . . 4. ASTELIA.

TRIBE IV. **Drymophileæ.**—*Perianth-segments distinct, spreading. Anthers erect.*

Style deeply divided into 3 stigmatic branches. Embryo near the hilum. Perennials with leafy stems. Leaf-veins all parallel.

Flowers hermaphrodite, axillary, solitary or 2 together . . . 5. DRYMOPHILA.

TRIBE V. **Asparageæ.**—*Perianth-segments distinct, spreading. Style undivided.*

Perianth persistent. Filaments abruptly thickened under the anther. Anthers erect, opening in terminal pores. Habit of *Anthropodium* (sub-tribe **Dianelleæ**) . . . . 6. DIANELLA.

Perianth deciduous. Filaments not thickened. Anthers opening in longitudinal slits. Leafy stems clongated and branched (sub-tribe **Euasparageæ**).

Cladodes (or leaves) clustered, subulate. Flowers axillary. Anthers versatile. Ovules 2 or very few in each cell . . 7. ASPARAGUS.

Leaves flat, solitary. Anthers erect. Ovules several in each cell. Tall climbers.

Flowers axillary, pedicellate. Inner perianth-segments fringed . . . . 8. EUSTREPHUS.

Flowers in loose terminal cymes. Inner perianth-segments entire . . . . 9. GEITONOPLESIUM.

TRIBE VI. **Dracæneæ.**—*Perianth gamophyllous, at least at the base, deciduous. Anthers versatile. Style undivided. Stems woody, sometimes arborescent. Flowers paniculate.*

Ovules solitary in each cell. Fruit pulpy, indehiscent . . . 10. DRACÆNA.

Ovules several in each cell. Fruit fleshy, often at length 3-valved . . . . 11. CORDYLINE.

SERIES II. **Capsulares.**—*Fruit dry, capsular or rarely of* 1 *to* 3 *indehiscent* 1-*seeded nutlets.*

TRIBE VII. **Hemerocallideæ.**—*Perianth gamophyllous, tubular or campanulate. Style undivided. Stock not bulbous.*

Ovary stipitate, with numerous ovules in each cell. Capsule septicidally 3-valved. Leaves crowded at the base of the stem. Flowers large, pendulous, in a terminal raceme . 12. BLANDFORDIA.

TRIBE VIII. **Melanthaceæ.**—*Perianth-segments free or shortly united at the base, rarely to the middle. Style more or less divided into 3 stigmatic branches or short distinct styles. Stock not at all or scarcely bulbous. Anthers frequently turned outwards.*

Stamens 3 opening outwards and equitant leaves of *Irideæ* (sub-tribe **Hewardiæ**) . . . . 13. HEWARDIA.

Stamens 6, perianth-segments united or imbricate at the base. (sub-tribe **Anguillarieæ**).

Perianth persistent, the segments shortly united at the base. Flowers paniculate . . . . 14. MILLIGANIA.

Perianth persistent, the segments more or less united at the base. Flowers solitary or simply spicate . . . . . 15. WURMBEA.

Perianth persistent, the segments quite distinct. Flowers simply spicate . . . . 16. ANGUILLARIA.

Perianth-segments separately deciduous. Flowers few. Inflorescence simple . . . . 17. IPHIGENIA.

Stamens 6. Perianth-segments quite free, deciduous, induplicate or convolute round the opposite stamens in the bud. (sub-tribe **Burchardieæ**).

Capsule loculicidally 3-valved. Leaves ovate or lanceolate.

Flowers solitary or few in a terminal umbel. Perianth-segments without appendages . . . . 18. SCHELHAMMERA.

Flowers solitary or few in axillary peduncles. Perianth-segments with glandular appendages at the base . . 19. KREYSIGIA.

Capsule septicidally 3-valved. Leaves few, linear. Flowers several in a terminal umbel . . . . 20. BURCHARDIA.

TRIBE IX. **Anthericeæ.**—*Perianth-segments free or very shortly united at the base.*

Style undivided, with a small terminal entire or slightly 3-dymous stigma. Stock not bulbous. Flowers racemose paniculate or umbellate, rarely solitary. Bracts thinly scarious usually hyaline or none, not glumelike.

Perianth deciduous, not twisted (sub-tribe **Phalangieæ**).
  Filaments bearded. Raceme simple . . . . 21. BULBINE.
Perianth spirally twisted over the ovary after flowering, at length deciduous (sub-tribe **Cæsieæ**).
  Capsule 3-valved. Filaments glabrous.
    Anthers 6, opening in terminal pores. Base of the perianth truncate and persistent. Raceme simple or once branched . . . . 22. AGROSTOCRINUM.
    Anthers 6 or 3, the cells opening longitudinally, but the outer valve produced beyond the inner. Inner perianth-segments fringed, enclosing the inner stamens in the bud. Umbels usually 2 or more flowered . . . . 23. THYSANOTUS.
    Anthers 3, cohering in a tube round the style, 3 free staminodia. Raceme simple . . . . 24. HODGSONIOLA.
    Anthers 6, free, opening in slits.
      Ovules 2 in each cell. Capsule obtuse-angular. Seeds globular. Umbels or clusters in a simple raceme. 25. CÆSIA.
      Ovules several in each cell. Capsule acutely angled or lobed. Seeds flattened. Flowers corymbose or paniculate . . . . 26. CHAMÆSCILLA.
  Nutlets 1-seeded, indehiscent. Anthers 6, opening in slits.
    Filaments glabrous. Nutlets solitary. Flowers minute, solitary or 2 together along the rigid branchlets . . . . 27. CORYNOTHECA.
    Filaments bearded or woolly. Nutlets usually 2 or 3. Umbels terminal . . . . 28. TRICORYNE.
Perianth not twisted, persistent round the fruit, unchanged or withering (sub-tribe **Chlorophyteæ**).
  Flowers loosely racemose cymose, or paniculate. Anthers 6, opening in slits.
    Filaments bearded or with adnate appendages under the anther.
      Anthers recurved after flowering. Seeds flattened. Flowers in a very loose cyme . . . . 29. STYPANDRA.
      Anthers not recurved. Seeds angular. Flowers loosely racemose . . . . 30. ARTHROPODIUM.
    Filaments glabrous. Anthers with basal crests. Seeds angular. Flowers loosely racemose . . . . . 31. DICHOPOGON.
    Stamens without beards or appendages. Capsule acutely 3-angled or 3-lobed. Seeds flattened. Flowers racemose . . . . 32. CHLOROPHYTON.
  Flowers large, solitary, almost sessile within a tuft of radical leaves. Anthers 6, opening in slits . . . . 33. HERPOLIRION.
  Flowers numerous, in umbels, with numerous scarious imbricate bracts.
    Anthers 3, divided into 2 long erect lobes. Umbels terminal . . . . 34. SOWERBYA.
    Anthers 6, small, ovate. Umbels on axillary peduncles. 35. ALANIA.

TRIBE X. **Johnsonieæ**. —*Perianth-segments free or united in a tube at the base. Style filiform, with a terminal entire stigma. Stock not bulbous. Flowers in dense heads or short spikes, solitary and sessile, or nearly so, within imbricate bracts.*

Perianth-segments free or the inner ones shortly united.
  Flower-heads globular. Bracts scarious.
    Anthers 6. Flowers uniform . . . . 36. LAXMANNIA.

Anthers 3. Flowers dimorphous in the same head . . 37. STAWELLIA.
Spikes oblong. Bracts glumaceous . . . . 38. JOHNSONIA.
Perianth hypocrateriform, with a cylindrical tube and equally spreading 6-lobed limb.
Anthers 3, connate round the style. Ovules 2 in each cell . . . . 39. ARNOCRINUM.
Anthers 6, distinct. Ovules several in each cell . . . 40. BORYA.

SERIES I. BACCATÆ.—Fruit succulent or fleshy, indehiscent or rarely opening tardily in 3 valves.

TRIBE I. SMILACEÆ.—Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo distant from the hilum. Albumen hard.—Branching climbers. Leaves with distant primary veins and transverse veinlets. Berry indehiscent.

1. SMILAX, Linn.

(Coprosmanthus, *Kunth.*)

Flower diœcious. Perianth deciduous, of 6 distinct spreading segments, all equal, or in species not Australian the 3 outer ones larger or united at the base, or the 3 inner ones wanting. Stamens 6, or in a few species not Australian 3, inserted at the base of the segments, filaments filiform or very short; anthers oblong, the 2 parallel cells separated by a scarcely prominent dissepiment, and when open apparently 1-celled; the stamens all rudimentary only in the female flowers. Ovary rudimentary or entirely deficient in the male flowers, sessile in the females, 3-celled, with 1, or rarely 2, erect ovules in each cell. Style very short, divided to the base or nearly so into 3 oblong usually recurved stigmatic lobes. Fruit a globular berry, usually ripening only 1 or 2 thick seeds without strophioles. Testa thin but hard, smooth and shining, closely appressed to the hard albumen. Embryo either very small or half the length of the albumen, distant from the hilum.—Branching climbers, the stems and main branches hard, often armed with scattered prickles. Leaves ovate orbicular or narrow, usually coriaceous and shining, with transverse or reticulate veins between the longitudinal nerves, marked with numerous small transparent dots, intermixed sometimes with larger oblong ones; the petioles usually short, bearing on each side a simple tendril, sometimes reduced to a short point, and more or less winged below the tendrils. Flowers small, white or pale green or purple; pedicellate in sessile or pedunculate umbels, which are either solitary in the axils, or several in axillary or terminal panicles. Bracts in the umbel very small, imbricate, with one pedicel in each axil.

A large genus, dispersed over the tropical and temperate regions both of the new and the old world. The Australian species are both endemic, though they are nearly allied to corresponding Asiatic species.

Perianth-segments broad, scarcely above 1 line long. Filaments shorter than the anthers . . . . 1. *S. glycyphylla.*
Perianth-segments narrow, 1½ to 2 lines long. Filaments rather longer than the anthers . . . . 2. *S. australis.*

1. **S. glycyphylla,** *Sm. in White, Voy.* 230.—Glabrous and quite unarmed. Leaves lanceolate or ovate-lanceolate, 1½ to 3 in. long or rarely more, acute or acuminate, narrowed or rounded at the base or rarely almost cordate, 3-nerved, rigid, often very glaucous or white underneath, but sometimes equally green on both sides; the petioles twisted, short but slender, bearing slender tendrils, but not at all or scarcely winged below them. Peduncles axillary and simple, or a few of the upper ones in a terminal panicle. Pedicels rarely 3 lines long. Perianth nearly globular in the bud, the outer segments broadly ovate, scarcely above 1 line long. Anthers almost sessile, very much shorter than the perianth. Female flowers not seen. Berry the size of that of *S. australis.*—R. Br. Prod. 293; Endl. Iconogr. t. 39; F. Muell. Fragm. vii. 77.

Queensland. Rockhampton, *Bowman*; Rockingham Bay, *Dallachy*.
N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart*; Hastings and Macleay Rivers, *Beckler*; Clarence River, *C. Moore*.

2. **S. australis,** *R. Br. Prod.* 293.—A glabrous climber, ascending sometimes to a considerable height, the stems and branches usually more or less armed with scattered prickles, of which, however, some specimens show none at all, or here and there only a very minute one. Leaves from ovate-lanceolate or oblong to nearly orbicular, 2 to 4 in. long, or rarely much larger; usually 5-nerved, but the outer nerve on each side often short or irregular, and sometimes scarcely distinguishable from the reticulate veins, the petioles short and twisted, narrowly or scarcely winged below the tendrils. Umbels many-flowered, on axillary peduncles usually simple and ½ to 1 in. long, but sometimes longer slightly branched and bearing 2 or 3 umbels. Pedicels filiform, 2 to 4 lines long. Perianth oblong when in bud, the segments narrow, 1½ to nearly 2 in. long. Filaments in the male flowers rather longer than the anthers, which are oblong and at length recurved: in the female flowers the filaments are usually present, but without anthers. Ovary entirely deficient in the males, sessile with 1 ovule in each cell in the females. Berry black, globular, about 4 lines diameter, with 1 globular seed or 2 flattened on their inner faces. Embryo often at least half as long as the albumen.—F. Muell. Fragm. vii. 78; *S. latifolia* and *S. elliptica*, R. Br. Prod. 293; *S. spinescens*, Miq. in Linnæa, xviii. 83.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. Goulburn Islands, *A. Cunningham*; Port Darwin, *Schultz, n.* 737; Liverpool River, *Gulliver*.
Queensland. Brisbane River, Moreton Bay, *A. Cunningham, F. Mueller*, and others; Rockingham Bay, *Dallachy*; Cape York, *M'Gillivray*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; northward to New England, *C. Stuart*; Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler, Wilcox, Henderson*, and others; southward to Illawarra, *A. Cunningham*; and Twofold Bay, *F. Mueller*; Lord Howe's Island, *C. Moore*.
Victoria. Snowy River and other localities in eastern Gipps' Land, *F. Mueller* and others.

The species seems nearly allied in many respects to the East Indian *S. ovalifolia*.

Roxb. which, however, has the leaves usually much larger, with broad wings to the petioles and the peduncles more branched. *S. China*, Linn., from China and Japan, is also at first sight very like the broad-leaved forms of *S. australis*, but has usually, if not always, 2 ovules to each cell of the ovary. Of R. Brown's species, *S. elliptica* is referred here from his short diagnosis agreeing well with some of the N. S. Wales specimens of *S. australis*, no specimen being preserved in his herbarium; his *S. latifolia*, from the Carpentaria Islands, is a broad-leaved form, precisely similar to some of our Arnhem's Land specimens, but without any prickles at all on the rather large specimens in Brown's herbarium. In other specimens, however, of several forms of this variable species, the prickles are so few and minute that they can only be detected by a very careful search. In others the prickles are numerous, and some of them thick and long, mixed with small ones.

Alph. de Candolle, who has in the press a very carefully prepared and studied monograph of Smilaceæ, in which he has brought out several characters hitherto neglected, distinguishes the northern *S. latifolia* Br. from the common *S. australis*, in that the former has the tendril from one-third to half-way up the petiole, which twists and finally disarticulates at some distance from the lamina, and has oblong or linear transparent dots on the leaf mixed with the ordinary small ones, whilst in *S. australis* the tendril is from half to two-thirds up the petiole, which disarticulates close to the lamina, and has only the ordinary small dots. But after carefully comparing his notes with the specimens before me from above thirty different stations, I find the greatest diversity in the proportionate lengths of the lower and upper parts of the petiole, and the exact place where the lamina breaks off; the dotting of the leaves would at first sight appear a more important character, but a further investigation prevents any use being made of it, at least in as far as our herbarium specimens show. In some Cape York specimens, with the leaves otherwise resembling some of the common N. S. Wales forms, the large oblong dots are rather numerous, the small round ones very few. In our Port Darwin ones, from Schultz, the oblong dots are few and much smaller, whilst the small round ones are very numerous. In the majority of the northern ones the small round ones are usually but not near always without any oblong ones. Herbarium specimens, however, are generally very imperfect, and rarely give males and females, flowers and fruits from the same stations; and it is very possible that a study of the living plants may show good characters for distinct varieties if not for permanent species.

2. RHIPOGONUM, Forst.

Flowers hermaphrodite. Perianth deciduous, of 6 distinct spreading segments, all equal or the outer ones shorter and often, but not always, surrounded by 2, 3, or even 4 small bracts. Stamens 6, hypogynous; filaments short, somewhat flattened; anthers sagittate, erect, nearly as long as the perianth. Ovary sessile, 3-celled, tapering at the top into a very short style, divided into 3 thick recurved stigmatic lobes; ovules solitary in each cell, pendulous, orthotropous or nearly so. Fruit a globular berry, usually ripening 1 globular seed, or sometimes 2 or 3 seeds variously flattened, with a large hilum, without any strophiole. Testa thin, light brown, closely adnate to the hard albumen. Embryo small, at a distance from the hilum.—Tall branching climbers. Leaves often mostly opposite or nearly so, but sometimes all alternate, 3 or 5-nerved, with transverse reticulate veins, the petioles without wings or tendrils. Flowers sessile or shortly pedicellate, in racemes either simple and axillary or the upper ones forming a terminal leafless panicle.

Besides the four Australian species, which are all endemic, there is one in New Zealand.

Glabrous. Leaves narrowed into a distinct twisted petiole.
  Leaves mostly 3 to 4 in., not above twice as long as broad. Flowers usually pedicellate . . . . . . 1. *R. album.*
  Leaves mostly 6 to 8 in., three times as long as broad. Flowers usually sessile . . . . 2. *R. discolor.*
More or less pubescent. Leaves rounded or cordate at the base and nearly sessile.
  Leaves 2 to 3 in. long. Ovary glabrous . . . . . . 3. *R. Fawcettianum.*
  Leaves 3 to 6 in. long. Ovary densely villous . . . . 4. *R. Elseyanum.*

1. **R. album,** *R. Br. Prod.* 293. A tall glabrous climber, the principal branches often covered with prickles, the smaller ones usually without any, or only with a few small ones. Leaves irregularly opposite or alternate, on short twisted petioles, elliptical or oblong, varying to ovate or almost lanceolate, shortly acuminate, narrowed at the base, mostly 3 to 4 in. long, though occasionally nearly twice as long or under 3 in.; coriaceous, 3- or 5-nerved, the intermediate reticulate veins prominent. Racemes axillary, simple, shorter or scarcely longer than the leaves, a few of the upper ones sometimes forming a terminal leafless panicle. Flowers usually distant along the rhachis, at first nearly sessile, but the pedicels growing out to 2 or 3 lines, or sometimes pedicellate from the first. Perianth 3 to 4 lines long. Ovary glabrous. Berry 4 to 5 lines diameter, said to be red when fresh, drying black. —Kunth, Enum. v. 272; F. Muell. Fragm. vii. 79; *R. Mooreanum*, F. Muell. Fragm. i. 44.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Rockhampton, *Dallachy* and others.
N. S. Wales Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; northward to New England, *C. Stuart*; Hastings, Clarence, and Richmond Rivers, *Beckler* and others; southward to Twofold Bay, *F. Mueller*.
Victoria. Snowy River, eastern Gipps' Land, *F. Mueller*.

Var. *leptostachya.* Racemes slender, often branched, but with few flowers on slender pedicels of 3 to 4 lines.

Queensland. Rockingham Bay, *Dallachy*.

2. **R. discolor,** *F. Muell. Fragm.* vii. 78.—A stout glabrous climber, nearly allied to *R. album*, with similar prickly or smooth branches. Leaves oblong or lanceolate, 6 to 8 in. long, and rarely above 2 in. broad, rounded or narrowed into a twisted petiole at the base, much thicker than in *R. album*, the transverse reticulate veins much fewer and not so fine. Racemes axillary, 4 to 6 in. long, the flowers sessile or nearly so. Perianth-segments rather shorter and broader than in *R. album.* Ovary glabrous.

N. S. Wales. Hunter's River, *A. Cunningham*; Clarence River, *Beckler*; New England, *Parrott*; Tweed River, *Guilfoyle*.

3. **R. Fawcettianum**, *F. Muell. Herb.*—Branches slender, without prickles, sprinkled with a loose rufous pubescence. Leaves on very short petioles or almost sessile, lanceolate or ovate-lanceolate, acuminate,

cordate at the base, 2 to 3 in. long, 3- or 5-nerved. Racemes axillary, slender but many-flowered. Flowers shortly pedicellate, rather smaller than in *R. album.* Filaments slender, as long as the anthers. Ovary glabrous.

N. S. Wales. Richmond River, *Fawcett;* Macleay River, *Fitzgerald.*

4. **R. Elseyanum,** *F. Muell. Fragm.* i. 44, vii. 80.—A stout climber, the branches leaf-nerves and rhachis of the racemes clothed with a loose brown pubescence, the main stems said to be prickly as in other species, although our specimens are entirely unarmed. Leaves on very short petioles or almost sessile, elliptical oblong or ovate, 3 to 6 lines long, acuminate, rounded or cordate at the base, of a thick texture, 3- or 5-nerved, but the lateral nerves starting from the midrib considerably above the base so as to be almost penninerved. Racemes axillary, about as long as the leaves. Flowers rather large, closely sessile or very shortly pedicellate. Perianth-segments oblong. Anthers long, on short filaments as in *R. album,* but the ovary very densely villous, contracted into a very short thick style, with closely adnate recurved stigmatic lobes. Ovules and fruit of *R. album.*

N. S. Wales. Archer's Station, *Leichhardt;* New England, *C. Stuart;* Richmond River, *Henderson.*

TRIBE II. FLAGELLARIEÆ.—Perianth, stamens, style and embryo of *Smilaceæ.* Albumen mealy. Leaf-veins all parallel and numerous. Drupe indehiscent.

3. FLAGELLARIA, Linn.

Perianth persistent, of 6 distinct nearly equal spreading segments, thin but coloured, the 3 inner ones rather larger. Stamens 6, hypogynous; filaments short, free; anthers erect, exceeding the perianth, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with 1 laterally attached ovule in each cell; style deeply divided into 3 linear-clavate stigmatic lobes. Fruit a small nearly globular indehiscent drupe, the exocarp thin, slightly succulent, the endocarp hard and long, 1- or rarely 2-celled, with 1 seed in each cell. Seed globular, with a thin membranous testa closely lining the endocarp, and a copious mealy albumen. Embryo small, broadly clavate, at a distance from the hilum. —Leafy climbers, with long leaves ending in a spirally twisted point. Flowers small, in a terminal panicle.

Besides the widely spread species here described, there appears to be a second one in the Feejee Islands, different, however, from the *F. plicata,* Hook. f., which is the *Joinvillea,* Gaud., not nearly so closely allied to *Flagellaria* as had been supposed.

1. **F. indica,** *Linn.: Kunth, Enum.* iii. 370.—A tall glabrous climber, ascending sometimes to the top of large trees, the branches encased at the base in the closed leafsheaths. Leaves long-lanceolate or linear-lanceolate, from 4 or 5 in. long to twice that length, besides the long

points spirally twisted into tendrils, variable in breadth, many-nerved but not plicate, rounded at the base and almost petiolate on the sheath which ends on each side in a short rounded auricle. Flowers white, very numerous, sessile in clusters or short spikes on the ultimate small branches of a dense terminal panicle, with a small scale-like bract under each flower and under the smaller branches. Perianth-segments about 1 line long. Fruit about 2 lines diameter.—Red. Lil. v. t. 257; Schnitzl, Iconogr. i. t. 51. b; R. Br. Prod. 264.

N. Australia. Port Essington, *Armstrong*; Point Pearce, *F. Mueller*; Escape Cliffs and Adams Bay, *Hulse*.

Queensland. Northumberland and Prince of Wales Islands, *R. Brown*; islands along the coast, *A. Cunningham*; Cape York, *M'Gillivray*, *Daemel*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, *Bowman*, and others; Moreton Bay, *Eaves*.

N. S. Wales. Hastings and Clarence Rivers, *Beckler*; Port Macquarrie, *Tozer*; Richmond River, *Henderson*; Lord Howe's Island, *Fullagar*.

The species extends over the tropical regions of Asia and Africa.

TRIBE III: ASTELIEÆ.—Perianth-segments distinct, spreading. Anthers erect. Styles or stigmas very short, distinct. Tufted herbs. Leaf-veins parallel. Berry indehiscent.

4. ASTELIA, Banks.

Flowers diœcious or nearly so. Perianth persistent, divided nearly or quite to the base into 6 equal spreading membranous segments. Stamens 6, attached to the base of the segments and shorter than them; filaments scarcely dilated; anthers ovate, erect or almost versatile, opening laterally or almost inwards in longitudinal slits, the stamens in the females reduced to small clavate staminodia. Ovary abortive or rudimentary in the males, sessile in the females, either 1-celled with 3 parietal placentæ, or more or less perfectly 3-celled with axile placentæ; ovules numerous to each placenta; style divided to the base or nearly so into 3 short stigmatic branches. Fruit a globular or oblong indehiscent berry. Seeds several, ovoid or angular, with a black shining crustaceous testa. Embryo small, near the base of the fleshy albumen.—Densely tufted herbs, more or less clothed with long silky or almost paleaceous hairs. Leaves crowded at the base of the stem, with broad imbricate sheaths. Flowers in terminal racemes or panicles, reduced in one or two dwarf species to 2 or 3 almost sessile flowers.

Besides the Australian species, which is endemic, there are several others spread over New Zealand, the Antarctic regions, and the southern extremity of America, growing sometimes in bogs or on mountain-tops, sometimes on the trunks of trees. For the remarkable diversity in different species in the placentation of the ovary and the seeds, see Hook. f. Fl. Ant. ii. 357.

1. A. alpina, *R. Br. Prod*, 291.—Leafy base of the stem very short, densely tufted, the long broad sheathing bases of the leaves densely covered with very long white silky hairs. Leaves from a few inches to 1 foot long, 3 to 5 lines broad, or in very luxuriant specimens attaining a breadth of 8 or 9 lines, the silky hairs of the upper portion very short and less apparent, but seldom quite wanting. Scapes very much shorter than the leaves, bearing a pyramidal panicle of 2 to 3 in. and loosely branched in the males, dense compact and very short in the females, with 1, 2, or 3, leafy bracts under the lower branches in both sexes. Perianth-segments about 2½ lines long and very spreading in the males, more erect and 3 lines long in the females. Ovary oblong, contracted at the end, with 3 very short obtuse stigmatic lobes, 1-celled, with few ovules on 3 parietal placentæ. Berry ovoid-oblong, under 1 in. long, surrounded by the somewhat enlarged persistent perianth. Seeds globular.—Hook. f. Fl. Tasm. ii. 60; *A. psychrocharis*, F. Muell. in Hook. Kew Journ. viii. 332.

Victoria. Mount Wellington in Gipps' Land, and in the Baw-Baw Mountains, at an elevation of 4000 to 5000 ft., *F. Mueller*.

Tasmania. Table Mountain, *R. Brown*; abundant on all the mountains, *J. D. Hooker* and others.

TRIBE IV. DRYMOPHILEÆ.—Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo near the hilum. Perennials with leafy stems. Leaf-veins all parallel. Berry indehiscent.

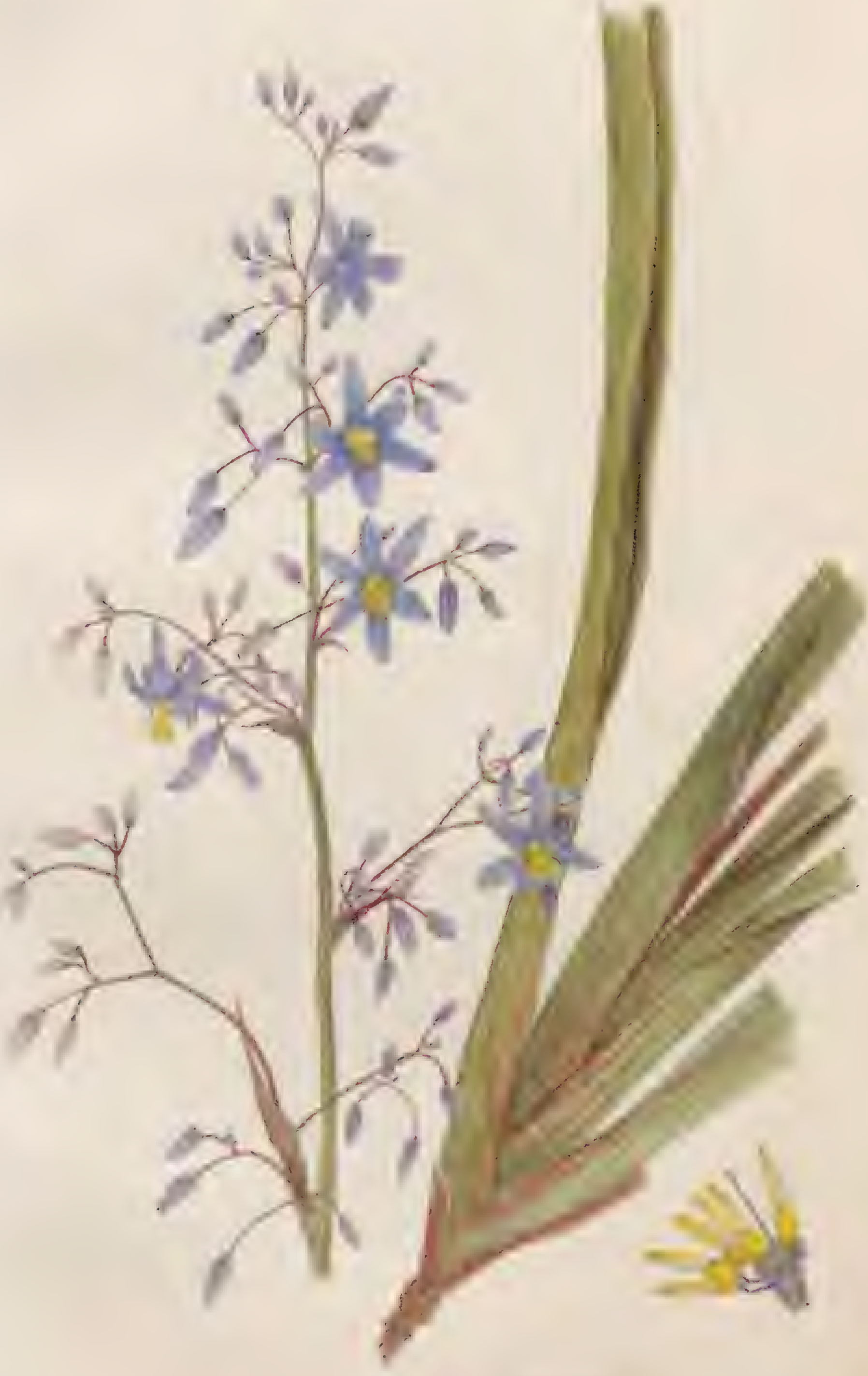
5. DRYMOPHILA, R. Br.

Perianth deciduous, of 6 distinct equal segments lanceolate and spreading or almost reflexed. Stamens 6, hypogynous, not exceeding the perianth and sometimes much shorter; filaments filiform; anthers oblong, erect, attached between the short basal lobes, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several often many ovules in each cell superposed in 2 rows. Styles 3, linear, slightly flattened, recurved, apparently stigmatic from near the base. Fruit a globular or ovoid berry. Seeds globular or variously shaped by mutual pressure; testa thickly membranous or almost crustaceous, adnate to the hard albumen; embryo short.—Perennials with simple or slightly branched leafy stems. Leaves distichous, spreading, sessile or nearly so. Flowers solitary or rarely 2 together in the axils, articulate on recurved pedicels, without bracts.

The genus is limited to Australia.

Berry blue, globular. Seeds 8 to 20, with a smooth brown testa	1. *D. cyanocarpa.*
Berry orange, ovoid. Seeds 3 or 4, with a very pale-coloured minutely-wrinkled testa	2. *D. Moorei.*

1. **D. cyanocarpa,** *R. Br. Prod.* 292.—Stems usually about 1 foot high, simple or with a few divaricate branches in the upper part, with a few brown sheathing scales in the lower leafless part. Leaves sessile or nearly so, lanceolate or almost oblong, varying from 1 to 3 in. in length, marked with numerous prominent nerves. Flowers white, the pedicels varying from scarcely above 1 line to nearly ½ in., spreading or



recurved. Perianth-segments usually about 3 lines long, but varying in size, marked with from 3 to 7 longitudinal veins. Berry blue, nearly globular, from 4 to 6 lines diameter. Seeds usually 8 to 20, with a smooth brown testa.—Baker in Journ. Linn. Soc. xiv. 571; F. Muell. Fragm. vii. 73; Hook, f. Fl. Tasm. ii. 49.

N. S. Wales. Hastings River, *Fraser*; Macleay River, *Fitzgerald.*
Victoria. Mount Warrenip, *Wilhelmi*: Skipton, *Whan*: Mount Macedon, *Walter*; Cape Otway Ranges, *F. Mueller.*
Tasmania. Table Mountain, *R. Brown*; abundant in grassy shaded places amongst fern, &c., *J. D. Hooker.*

3. **D. Moorei,** *Baker in Journ. Linn. Soc.* xiv. 571.—Closely resembles *D. cyanocarpa* in habit and stature, but the leaves are broader, from almost ovate to oblong-lanceolate. Flowers apparently similar. Berry ovoid, said to be orange-coloured, about ½ in. diameter, with only 3 or 4 seeds fully twice the diameter of those of *D. cyanocarpa*, the testa very pale coloured, thin or more or less wrinkled. How far these differences prove constant remains to be proved.—*D. pyrrhocarpa*, F. Muell. Fragm. ix. 190.

N. S. Wales. Hastings and Macleay rivers, *C. Moore*; Clarence River, *Wilcox.*

TRIBE V. ASPARAGEÆ.—Perianth-segments distinct, spreading. Style undivided. Berry indehiscent or very tardily dry and 3-valved.

6. DIANELLA, Lam.

Perianth persistent, of 6 distinct oblong segments, either equal in length or the 3 inner ones rather shorter, all with thin margins, and 3 to 5 rarely 6 or 7 parallel veins more or less approximate in the centre. Stamens 6, 3 opposite the outer segments hypogynous, 3 more or less adhering to the base of the inner segments; filaments abruptly thickened at the apex or nearly to the base; anthers erect, the cells opening in terminal pores often continued in longitudinal slits sometimes nearly to the base. Ovary sessile, short, 3-celled, with several superposed ovules in each cell; style filiform, with a terminal somewhat capitate stigma, entire or slightly 3-furrowed. Fruit a blue indehiscent berry. Seeds few, variously shaped, with a black testa coriaceous smooth and shining, a white waxy albumen and small embryo.—Glabrous perennials, with thick fibrous roots, the stock often stoloniferous or slightly branched. Scapes or stems erect, rigid, often several feet high. Leaves crowded at the base of the stems or more or less spread on the lower part, distichous and sheathing at the base, with a long lamina, a few upper ones reduced to short sheaths and a small erect lamina. Flowers blue, pedicellate, nodding, in loose dichotomous cymes collected in a terminal panicle. Bracts at the base of the pedicels small and scarious or none. Pedicels articulate close under the flower.

The genus is chiefly Australian, but extends in a very few species to tropical Asia, the Mascarene and Pacific Islands, and New Zealand. Of the five Australian species one is a common Asiatic one, the other four are endemic. In their typical forms the five are very distinct, but they are all so variable and connected by so many intermediates that I have found it very difficult to distribute satisfactorily the numerous dried specimens before me. It is not impossible, however, that a careful study of living plants in their native country may disclose more positive characters to distinguish even twice as many more or less permanent forms.

Leaves radical or nearly so, very shortly sheathing the base of the stem.
  Anthers shorter than the filament, which is thickened from below the middle. Leaves long and broad . . 1. *D. tasmanica.*
  Anthers longer than the filament, which is thickened only above the middle.
    Leaves narrow, usually long and nearly flat, the sheathing base scarcely keeled . . . . 2. *D. lævis.*
    Leaves long, narrow, rigid, with the margins much revolute, the sheathing base keeled . . . . . . 3. *D. revoluta.*
Stem often branching at the base and more or less leafy, the sheathing base of the leaves laterally flattened and acutely keeled. Anthers longer than the filament.
  Leaves narrow, mostly under ½ in. broad . . . . . . 4. *D. cærulea.*
  Leaves ½ to 1 in. broad . . . . 5. *D. ensifolia.*

1. **D. tasmanica,** *Hook. f. Fl. Tasm.* ii. 57, *t.* 133.—Stems attaining sometimes 4 or 5 ft. though often shorter. Leaves distichous and crowded at the base of the stem, usually 1 to 2 feet long and ¼ to nearly 1 in. broad, the margin and midrib scabrous, those on the stem reduced to a few short distant sheaths with short erect laminæ or points. Panicle often above 1 ft. long, the cymes loose, with recurved pedicels. Perianth-segments about 3½ lines long, all usually 5-nerved, or the outer ones sometimes with 6 or 7 or the inner with only 3 nerves. Filaments much thickened from below the middle or almost from the base, and usually longer than, often twice as long as, the oblong anther. Berry globular or ovoid-oblong, about ½ in. long.—Baker in Journ. Linn. Soc. xiv. 575; F. Muell. Fragm. vi. 121; Bot. Mag. t. 5551.

Victoria. Mount Baw-Baw and Cape Otway, *F. Mueller.*
Tasmania. Common in rich moist soil, *J. D. Hooker.*

D. Archeri, Hook. f. Fl. Tasm. ii. 58, appears to be scarcely even a distinct variety, nor can I well separate *D. Hookeri*, Baker, l. c. (*D. lævis*, Hook. f. l. c. 57, not of Br.). *D. densa*, Lindb. in Act. Soc. Sc. Fenn. x. 132, t. 6, is also referred to this species by Baker. *D. angustifolia*, Schult. Syst. vii. 352, described from a Tasmanian specimen in Martius' herbarium, is most probably a narrow-leaved form of *D. tasmanica.*

2. **D. lævis,** *R. Br. Prod.* 280.—Stems varying from under 1 ft. in some of the inland specimens to 2 or 3 ft. in luxuriant ones from Queensland. Leaves usually few at the base of the stem, the short sheathing base rounded on the back or only slightly compressed and scarcely keeled, the blade in the typical specimens very long and narrow, often above 2 ft. long and ¼ to nearly ½ in. broad, flat or with scarcely recurved margins when dry, the edges smooth or slightly scabrous; in the smaller inland specimens the leaves are much shorter than the stem

and spreading or recurved. Panicle varying from loose and spreading to narrow with the cymes contracted into short clusters. Perianth-segments 3 to 4 or rarely 5 lines long, all 5-nerved or the inner ones only 3-nerved. Filaments with the thickened apex much shorter than either the filiform base or the oblong-linear anther, which varies from 1½ to 2 lines long. Berry globular, smaller than in *D. tasmanica*.—Baker in Journ. Linn. Soc. xiv. 577; *D. longifolia*, R. Br. Prod. 280; F. Muell. Fragm. vi. 122. *D. strumosa*, Lindl. Bot. Reg. t. 751.

Queensland. Various localities from Moreton Bay to Rockhampton, but apparently not abundant, *A. Cunningham*, *F. Mueller*, and others; Keppel Bay to Northumberland Islands, *R. Brown*, all the long-leaved forms.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Miss Atkinson*, and others; New England, *C. Stuart*, including a slender variety with the leaves not 2 lines broad.

Victoria. On the Yarra, *F. Mueller*.

Tasmania. Some specimens from South Esk River, *C. Stuart*, in Herb. F. Mueller, appear to belong to this species, besides those referred by *F. Mueller* to *D. elegans*.

S. Australia. Lofty Range, *Wirth*; Barossa Range, *F. Mueller*.

Var. *aspera*. Leaves usually short, spreading, rigid, and often, but not always, scabrous on the edges and midribs. *D. elegans*, F. Muell. Fragm. vi. 122, but scarcely of Kunth, who describes the anthers as brown, whilst they appear to be always yellow in *D. lævis*.

D. rara, R. Br. Prod, 280, from Shoal Bay, *R. Brown*, appears to me, from the imperfect specimen in his herbarium, to be a slender starved state of *D. lævis*.

3. **D. revoluta,** *R. Br. Prod.* 280.—Leaves distichous and crowded at the base of the stem as in *D. tasmanica*, the sheaths with prominent keels, two or three outer ones with scarcely any or very short laminæ, the inner ones with narrow rigid blades often 2 or 3 ft. long, with the margins closely revolute over the midrib, leaving a deep furrow on the upper side, the edges and midrib scabrous or smooth. Panicle when fully out looser and more spreading with larger flowers more deeply coloured than in *D. cærulea*. Perianth, especially in the southern specimens, often above 4 lines long, usually smaller in the northern ones. Anthers considerably longer than the filaments, of which the thickened apex is usually very short. Berries small. globular.—Baker in Journ. Linn. Soc. xiv. 578; F. Muell. Fragm. vi. 121; *D. divaricata*, R. Br. Prod. 280; Baker, l. c.; *D. longifolia*, Bot. Reg. t. 734, not of R. Br.

Queensland. Upper Burnett River, *F. Mueller*; Rockhampton, *O'Shanesy*, *Bowman*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 198; Hastings River, *Beckler*; Nurrum-Nurrum, *Leichhardt*.

Victoria. Common in dry districts, especially near the sea-coast, *F. Mueller*, *Robertson*, and others.

S. Australia. Round Spencer's and St. George's Gulfs, *F. Mueller*, *Blandowski*, and others.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller*, and others; and thence eastward to the Great Bight, *Maxwell*; and northward to Swan and Murchison Rivers, *Drummond*, *Preiss*, *n.* 1537, *Oldfield*.

4. **D. cærulea**, *Sims, Bot. Mag. t.* 505.—Leaves distichous and sheathing at the base, not so closely crowded on the stock as in the preceding species but more or less extending over the lower part of the stem, which is often branched at the base; the sheaths much flattened laterally, prominently and acutely keeled, and usually but not always scabrous on the edges; the lamina long, erect, and narrow, rarely attaining ½ in. in breadth and sometimes under 2 lines. Panicle usually loose as in *D. lævis*, but often smaller and the cymes sometimes dense and almost sessile along the main rhachis. Perianth-segments 3 to 4 lines long, with 5 or 3 nerves less crowded in the centre than in *D. lævis*, and the flowers usually blue. Filaments shorter than the anthers, with the thickened apex not longer than the filiform base and sometimes very short. Berry small and globular.—R. Br. Prod. 279; Baker in Journ. Linn. Soc. xiv. 576; F. Muell. Fragm. vi. 123; Red. Lil. ii. t. 79; *D. revoluta*, Bot. Reg. t. 1120.

N. Australia. Port Darwin, *Schultz, n.* 163 and 351; the specimens appear to be referrible rather to a broad leaved form of *D. cærulea* than to *D. ensifolia.*

Queensland. Moist shady valleys and marshy places, from Moreton Bay, *A. Cunningham* and others, to Rockingham Bay, *Dallachy*; Palm Island, *Henne*; Cape York, *M'Gillivray, Hann's Expedition.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 199, and many others; northward to New England, *C. Stuart*; Hastings, Clarence, and Richmond rivers, *Beckler* and others; Lord Howe's Island, *C. Moore*.

This appears to be the commonest species from Port Jackson northwards, but I have seen no southern specimens.

D. graminifolia, Kunth Enum. v. 46, and *D. elegans*, Kunth l.c. v. 49, dubiously referred by Baker to *D. cærulea*, may belong to that species, but are not determinable from the wordy descriptions of single garden specimens, without any differential characters, and omitting some of the most essential ones.

D. congesta, R. Br. Prod. 280, Baker in Journ. Linn. Soc. xiv. 576, from Prince of Wales Islands, Torres straits, appears to me to be a form of *D. cærulea*, with dense sessile cymes; the inflorescence, however, in the specimen preserved is scarcely fully developed and almost destroyed by insects.

5. **D. ensifolia**, *Red Lil. t.* 1.—Very near the broad-leaved forms of *D. cærulea*, with the stems similarly leafy in the lower part and the sheaths acutely keeled, but the blades usually much broader, varying from ½ to 1 in. in breadth and the sheaths shorter and looser. Panicle of *D. cærulea*. Perianth-segments fully 4 lines long. Filaments shorter than the anthers, the thickened part very short and as broad as the anthers themselves. Fruit nearly globular, larger than in *D. cærulea*, but not so large as in *D. tasmanica*.—Baker in Journ. Linn. Soc. xiv. 576; Bot. Mag. t. 1404; *D. nemorosa*, Jacq. Hort. Schœnbr. t. 94.

Queensland. This, the common species in tropical Asia and in the Mascarene and Pacific Islands, appears to be represented in Australia by specimens from Rockingham Bay, *Dallachy*, precisely similar to some from China and the Philippine Islands; those from Arnhem's Land, referred to this species by Baker, appear to me to be nearer *D. cærulea*, but the distinction between these two very variable species is as yet very uncertain.

7. ASPARAGUS, Linn.

(Asparagopsis, *Kunth.*)

Flowers hermaphrodite polygamous or unisexual. Perianth deciduous, of 6 distinct nearly equal spreading 1-nerved segments. Stamens 6, attached to the base of the segments; filaments filiform or flattened; anthers versatile, usually short, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with 2 or very few ovules in each cell; style simple, with a short 3-lobed stigma. Fruit a globular indehiscent berry. Seed usually reduced to a single one, with a black shining testa; albumen hard; embryo transverse.—Stems herbaceous, from a creeping rhizome, or shrubby much-branched and spreading or climbing to a considerable height, often armed with prickles under the branches. Cladodes (formerly called leaves, but now theoretically believed to be abortive branches) usually clustered, subulate, angular or laterally flattened, surrounded by small scarious scales representing the real leaves. Flowers small, solitary or 2 together in the axils of the scale-like real leaves, or by the reduction of flowering branches without cladodes forming short axillary racemes.

A very large genus, widely spread over the warmer and temperate regions of the Old World. The only Australian species extends also over tropical and subtropical Asia and Africa.

1. **A. racemosus,** *Willd.; Baker in Journ. Linn. Soc.* xiv. 623.—A slender but rigid much-branched straggling shrub, often climbing to a considerable height, armed with recurved prickles under the branches. Cladodes usually in clusters of 3 to 6, but sometimes solitary, very slender, slightly curved or rarely quite straight, flat or 3-angled, but always very narrow or subulate, very acute, mostly ¾ to nearly 1½ in. long. Flowers mostly hermaphrodite, in racemes of 1 to 2 in., the pedicels scattered singly or 2 together along the rhachis, and usually about 2 lines long. Perianth-segments nearly 1½ lines long. Stamens nearly as long as the perianth, the filaments slightly flattened; anthers small. Style short, with a spreading 3-lobed stigma. Berries small.—*A. fasciculatus*, R. Br. Prod. 281; F. Muell. Fragm. vii. 73; *Asparagopsis floribunda*, *A. Brownei*, and *A. Decaisnei*, Kunth, Enum. v. 98, 103, and numerous other synonyms quoted by Baker.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; mouth of Victoria River, *F. Mueller*; Goulburn Islands, *A. Cunningham*; King's Sound and Collier Bay, *Chapman*; Glenelg District, *Martin*; Liverpool River, *Gulliver*; Port Essington, *Armstrong*; Port Darwin, *Schultz*, *n.* 169.

Queensland. Cape York, *Daemel*; Cape Sidmouth, *C. Moore.*

Mr. Baker was of opinion that Brown's specimen might be referrible to an allied Asiatic species, *A. acerosus*, Roxb., but it appears to me to be precisely similar to some of Schultz's; and although it has the cladodes slightly firmer and more straight than usual in *A. racemosus*, yet not nearly so much so as in the true *A. acerosus*.

8. EUSTREPHUS, R. Br.

Perianth deciduous, of 6 distinct oblong segments, nearly equal in length, the 3 outer rather firmer, valvate in the bud, and shortly hoodshaped at the apex; the 3 inner flat, obtuse, with thin more or less fringed margins. Stamens 6, hypogynous, not exceeding the perianth; filaments flat, erect, and often cohering in a tube; anthers oblong, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, with a terminal undivided stigma. Fruit nearly globular, 3-celled, with little or no pulp, the pericarp succulent, but at length dry, and often opening loculicidally in 3 valves. Seeds irregularly shaped, with a black thickly membranous testa, hard albumen, and small embryo.—A glabrous, much-branched leafy climber. Flowers small, few together, pedicellate in the upper axils.

The genus is limited to a single species exclusively Australian.

1. **E. latifolius.** *R. Br. Prod.* 281.—Stems much branched, often climbing to a great height, weak and flexuose, but not twining. Leaves sessile or nearly so, varying from broadly ovate-lanceolate to narrow-linear, usually tapering to a point, of a firm texture, with numerous fine but prominent nerves, mostly 2 to 4 in. long, those under the branches often reduced to small scales. Pedicels 2 to 6 together in the upper cells, filiform but rigid, 4 to 9 lines long, articulate close under the flower and persistent. Perianth-segments usually about 3 lines long. Stamens varying much in the respective proportions of the filaments and anthers, but both together usually almost as long as the perianth. Fruit usually above ½ in. diameter, of an orange colour, with about 8 to 12 seeds, but sometimes much smaller with very few seeds.—Baker in Journ. Linn. Soc. xiv. 572; Bot. Mag. t. 1245; Endl. Iconogr. t. 4; *E. Watsonianus*, Miq. in Linnæa., xviii. 84; *E. Brownei*, F. Muell. Fragm. vii. 73; *Luzuriaga latifolia*, Poir. Dict. Suppl. iii. 535.

Queensland. Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; northward to Macleay River, *Beckler;* southward to Illawarra, *Shepherd*, *Ralston;* Twofold Bay, *F. Mueller.*
Victoria. Snowy River, *F. Mueller.*

Var. *angustifolia.* Leaves mostly linear or narrow-lanceolate, but occasionally with a few broad ones.—*E. angustifolius*, R. Br. l. c.; *Luzuriaga angustifolia*, Poir. l. c. 536.

Queensland. Much more common in tropical and subtropical latitudes than the broad-leaved form. Shoalwater Bay to Northumberland Islands, *R. Brown;* from Moreton Bay, *A. Cunningham* and others, to Rockhampton, Port Denison, Rockingham Bay, &c., *Bowman*, *Fitzalan*, *Dallachy*, and many others.
N. S. Wales. Port Jackson, *U. S. Exploring Expedition;* Richmond River, *Fawcett*, but the leaves all narrow in few specimens only.

9. GEITONOPLESIUM, A. Cunn.

Perianth deciduous, of 6 distinct oblong segments, equal in length, the 3 outer rather firmer, valvate in the bud and shortly hood-shaped at the apex; the 3 inner flat, obtuse, with thin entire margins, slightly imbricate. Stamens 6, hypogynous, not exceeding the perianth; fila-

ments filiform, free or very slightly connected in a ring at the base; anthers oblong-linear, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, the stigmatic apex undivided. Fruit nearly globular, 3-celled, without pulp, the pericarp somewhat succulent, at length dry and often opening loculicidally in 3 valves. Seeds irregularly shaped, with a black, rather thickly membranous testa, hard albumen and small embryo.—A glabrous, much-branched leafy climber. Flowers small, in loose terminal cymes.

The genus is limited to the single Australian species which extends to the South Pacific Islands. It closely resembles *Eustrephus* both in habit and character, differing only in inflorescence and in the entire not-fringed inner perianth-segments.

1. **G. cymosum,** *A. Cunn. in Bot. Mag. t.* 3131.—Stems much branched, twining and climbing to a considerable height, with small broad scales under each branch. Leaves from linear to lanceolate-oblong or almost ovate, contracted into a short petiole, obtuse acute or tapering into a fine point, usually 2 to 3 in. long, rather rigid, with fine nerves, the midrib more prominent. Flowers drooping, in loose terminal cymes, sometimes short simple and few-flowered, sometimes several in an oblong panicle of 3 to 4 in. Perianth purplish-green, 3 to 4 lines long, the pedicels usually shorter, articulate close under the flower, with a minute bract. Berry-like fruit of a dark blue, 4 to 6 lines diameter. Seeds few.—Baker in Journ. Linn. Soc. xiv. 572; F. Muell. Fragm. vii. 74; *Luzuriaga cymosa* and *L. montana*, R. Br. Prod. 282; *Medeola angustifolia*, Red. Lil. t. 393; *Geitonoplesium montanum* and *G. asperum*, A. Cunn. l. c.; *G. angustifolium*, C. Koch in Walp. Ann. vi. 143.

Queensland. From Moreton Bay, *A. Cunningham*, *Leichhardt*, to Rockhampton, Rockingham Bay, and Percy Islands, *Dallachy*, *A. Cunningham*, and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart;* Richmond, Clarence and Hastings Rivers, *Beckler*, *Henderson*, *C. Moore*, and others; southward to Kiama, *Harvey*; Illawarra, *A. Cunningham*, *Shepherd*; and Twofold Bay, *F. Mueller*.

Victoria. Lake King and other localities in eastern Gipps' Land, *F. Mueller* and others.

TRIBE 6. DRACÆNEÆ. Perianth more or less gamophyllous, deciduous. Anthers versatile. Style undivided. Berry indehiscent, or at length dry and 3-valved. Stems woody, sometimes arborescent. Flowers paniculate.

10. DRACÆNA, Linn.

Perianth deciduous, tubular, straight, with 6 equal narrow lobes, as long as or shorter than the tube. Stamens 6, inserted at the orifice of the tube, and not exceeding the lobes; filaments filiform or flattened; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with 1 erect ovule in each cell; style filiform, with a capitate obscurely 3-lobed stigma. Fruit a succulent indehiscent berry, with 3 cells and seeds, or frequently 1 or 2 only by abortion. Seeds thick and large, with a thin smooth testa closely adhering to the hard albumen; embryo usually small.—Shrubs or trees, the trunk and branches marked by the annular scars of fallen leaves. Leaves at the ends of the branches long and narrow, sessile or contracted into a petiole, dilated and stem-clasping but scarcely sheathing at the base. Flowers in panicles or heads, articulate on the top of the pedicels. Bracts usually small, scarious, with a pair of smaller bracteoles when the flower is solitary within the bract, several when the flowers are clustered.

A considerable genus, inhabiting the warmer regions of the Old World and including the celebrated Dragon trees of Teneriffe. The only species found in Australia is shrubby and widely spread over the Indo-Australian region.

1. **D. angustifolia,** *Roxb.*; *Baker in Journ. Linn. Soc.* xiv. 526.—Stems not much branched and slender but woody, attaining 6 to 12 ft. in height. Leaves rather crowded under the terminal panicle, 8 in. to nearly 1 ft. long, ½ to 1 in. broad, ending in a fine point, shortly contracted at the base but not distinctly petiolate nor sheathing. Panicle ½ to 1 ft. long, with few branches, the pedicels 2 to 3 lines long, very slender, usually clustered 2 or 3 together along the branches. Bracts and bracteoles small. Perianth narrow, white or greenish, about ¾ in. long, the lobes linear, rather longer than the tube. Stamens attached about the middle of the tube, the anthers much shorter than the filiform filaments. Fruit ½ in. diameter or rather more, pulpy inside, with 1, 2 or 3 large seeds.—*Cordyline Rumphii*, F. Muell. Fragm. v. 194, but not the plant figured under that name in Bot. Mag. t. 4279; *Dracæna reflexa*, F. Muell. Fragm. vi. 120, but not the Mauritius plant to which Lamarck gave that name.

N. Australia. Port Essington, *Armstrong*; Port Darwin, *Schultz, n.* 857; Castlereagh River, *Gulliver*.

Queensland. Port Macquarrie and all along the east coast northwards, *A. Cunningham*; Barnard and Fitzroy Islands, *M'Gillivray*; Cape York, *Daemel*.

11. CORDYLINE, Comm.

Perianth deciduous, tubular, straight, with 6 narrow lobes, usually longer than the tube, all equal or the 3 outer ones rather shorter. Stamens 6, inserted at the base of the lobes and shorter than them or scarcely longer; filaments filiform or flattened; anthers narrow-oblong, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several (4 to 16) ovules in each cell, superposed in 2 rows; style filiform, with a capitate or shortly 3-lobed stigma. Fruit nearly globular, 3-celled, without pulp, but the pericarp more or less succulent, often becoming quite dry when fully ripe, indehiscent or more or less opening loculicidally in 3 valves. Seeds several in each cell, or solitary by abortion, variously shaped but usually curved, the testa crustaceous, black

and shining; albumen waxy; embryo curved and sometimes nearly as long as the albumen.—Shrubs or trees, the branches marked by the annular scars of the fallen leaves. Leaves crowded under the panicle or more or less spread along the branches, long and narrow or short and broad, petiolate or nearly sessile, with short imbricate sheaths. Panicles terminal or sometimes axillary, the flowers usually smaller than in *Dracæna*, solitary or clustered along the branches, sessile or pedicellate, each within a small bract with 2 small bracteoles at their base.

The genus is widely spread over the warmer regions of the Old World, with one American species. Of the three Australian species, one is common over a great part of the Indo-Australian region, the two others are endemic.

Perianth-segments of equal length.
  Leaves 1 to 1½ ft. long, 1 to 3 in. broad, with a short petiole . . . . 1. *C. terminalis.*
  Leaves 3 to 6 in. long, 1½ to 2½ in. broad, with a rather long petiole . . . . 2. *C. Haageana.*
Inner perianth-segments longer than the outer. Leaves 1 to 2 ft. long, ½ to 1 in. broad or even narrower . . . 3. *C. stricta.*

1. **C. terminalis,** *Kunth; Baker in Journ. Linn. Soc.* xiv. 539.—Stems attaining 3 to 6 ft. Leaves crowded under the panicle, from 1 to 1½ ft. long or the upper ones half that length, varying from 1 to 3 in. broad, acuminate at the end and tapering at the base into a sheathing petiole. Panicle often 1 ft. long, with spreading solitary or clustered branches of 3 to 8 in. Flowers scattered along the branches either singly or in clusters of 2 or 3, varying from almost sessile to borne on pedicels attaining sometimes 4 or 5 lines. Perianth usually about 4 lines but sometimes attaining 5 lines in length, white reddish or almost purple, divided to about the middle into 6 equal segments. Stamens attached near the base of the segment; anthers not much shorter than the filaments and not exceeding the perianth. Ovules 4 to 10 in each cell of the ovary. Fruit nearly globular, 3 to 4 lines diameter in the dried specimens, more or less succulent before it is ripe, but usually becoming dry or nearly so when the seeds are fully ripe.—*Dracæna terminalis*, Jacq. Ic. Rar. t. 448; Red. Lil. t. 91; Bot. Reg. t. 1749; Lodd. Bot. Cab. t. 1224; *D. ferrea*, Linn.; Bot. Mag. t. 2053; *Cordyline cannæfolia*, R. Br. Prod. 280; F. Muell. Fragm. v. 196.; *C. sepiaria*, Seem. Fl. Vit. 311, t. 94.

Queensland. Shoalwater Bay, *R. Brown*; Ipswich, *Nernst*; Pine River, *Fitzalan*; Rockingham Bay, *Dallachy*.

N. S. Wales. Clarence River, *Beckler*; Richmond River, *Henderson, Fawcett*.

The species is generally spread over tropical Asia and Polynesia. In the ordinary Australian form, which is also the common one elsewhere, the pedicels are rarely above 1 line long, and frequently the flowers are all but sessile, the leaves are usually from 6 to 10 times as long as broad. From this the var. *hedychioides* or *C. hedychioides*, F. Muell. Fragm. v. 196, from Cape York, appears to me only to differ in the leaves broader in proportion to their length. The fruit in our specimens may be a trifle larger, but if taken at the same degree of maturity does not appear to be drier than in the common form.

Var. *Manners-Suttoniæ* or *C. Manners-Suttoniæ*, F. Muell. Fragm. v. 195, from Mount Elliott, *Fitzalan*, and Rockhampton, *Dallachy*, *Bowman*, is remarkable for the rather large white flowers on pedicels in the typical specimens 4 to 5 lines long, but, as shown by Baker, it is closely connected with the common form by several extra-Australian varieties, amongst others by that gathered by Sieber in the Mauritius.

2. **C. Haageana,** *C. Koch, Wochenschr. für Gartn.* 1867, 195.—A small leafy species, the stems often not above 2 ft. high. Leaves much shorter than in the other species, usually 3 to 6 in. long and 1½ to 2½ in. broad, abruptly contracted into a rather long petiole, and covering nearly the whole of the flowering branch. Panicles sometimes not longer than the leaves, sometimes twice as long, with few branches. Flowers the same as in *C. terminalis.* Fruit also similar but smaller.—Baker in Journ. Linn. Soc. xiv. 541; *C. Murchisoniæ*, F. Muell. Fragm. v. 195.

Queensland. *A. Cunningham;* Rockhampton, *O'Shanesy;* Rockingham Bay and Mount Elliott, *Dallachy;* Port Denison, *Fitzalan.*

3. **C. stricta,** *Endl. in Ann. Wien. Mus.* i. 162.—Habit and stature of *C. terminalis*, but the leaves very much narrower, rarely 1 in. and often not above ½ in. broad when 1 to 2 ft. long. Perianth and inflorescence of *C. terminalis*, except that the three outer segments of the perianth are distinctly shorter than the inner ones when the flower is fully out, and sometimes not above ⅔ of their length. The pedicels are also usually very short or the flowers quite sessile.—F. Muell. Fragm. v. 195; Baker in Journ. Linn. Soc. xiv. 544; *Dracæna stricta*, Sims, Bot. Mag. t. 2575; Bot. Reg. t. 956: *Charlwoodia congesta*, Sweet, Fl. Austral. t. 18; *Cordyline angustifolia* and *C. congesta*, Kunth, Enum. v. 32; *C. rigidifolia*, C. Koch and Bouché in Berl. Gartenzeit. quoted by Baker.

Queensland. Moreton Bay, *Fraser.*

N. S. Wales. Port Macquarrie, *Tozer;* Hastings River, *Beckler;* Richmond River, *Henderson* and others; Clarence River, *Wilcox.*

SERIES 2. CAPSULARES. Fruit dry, capsular or rarely of 1 to 3 indehiscent 1-seeded nutlets.

TRIBE 7. HEMEROCALLIDEÆ. Perianth gamophyllous, tubular or campanulate. Style undivided. Stock not bulbous.

12. BLANDFORDIA, Sm.

Perianth persistent, tubular but much widened upwards and sometimes almost campanulate, with 6 equal short and broad lobes. Stamens 6, attached at or rather above the middle of the corolla-tube and shorter or scarcely longer than its lobes; filaments filiform; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary contracted into a long stipes, 3-celled, with numerous ovules in a double row in each cell, tapering into a short style, with a terminal 3-grooved stigma. Capsule on a long stipes, long and narrow, prominently 3-angled, opening septicidally in 3 valves. Seeds numerous, horizontal, oblong, the testa rather thick and densely covered with very prominent almost hair-like papillæ; albumen copious.—Herbs with thickly fibrous roots and tall rigid scapes or stems. Leaves crowded at the base of the stem, with

distichously imbricated sheaths, the lamina long and narrow with prominent nerves; a few upper leaves distant, short and erect. Flowers large, pendulous, in a short simple terminal raceme, each one in the axil of a narrow bract, with two smaller very narrow bracteoles at the base of the pedicel. Capsule erect, more or less surrounded by the withered perianth.

The genus is limited to Australia.

Flowers rather numerous and crowded, the pedicels when in flower rarely exceeding the bracts.
  Perianth (about 1½ in.) narrow and gradually tapering to the base. Lobes about ¼ in. Stamens attached far above the middle . . . . 1. *B. marginata.*
  Perianth (about 2 in.) narrow in the lower part, very broad upwards. Lobes about ½ in. Stamens attached below the middle . . . . 2. *B. grandiflora.*
Flowers few, in a loose raceme, the pedicels much longer than the bracts.
  Perianth (1 to 1¼ in.) narrow in the lower part, abruptly dilated at about the middle, not broader at the throat . 3. *B. nobilis.*
  Perianth (1½ in. or more) broad almost from the base and much dilated upwards, almost campanulate . . . . 4. *B. flammea.*

1. **B. marginata,** *Herb. in Bot. Reg.* 1842, *Misc.* 84, 1845, *t.* 18.—Stems rather stout, attaining 2 to 3 ft. Lower or radical leaves often above 1 ft. long and 3 or 4 lines broad, the upper ones few, short and erect. Racemes usually short and crowded, but sometimes lengthening to 6 or 8 inches. Flowers numerous, of a rich brown red, the pedicels at first very short, but lengthening to 1 or even to 2 inches. Bracts narrow, often longer than the flowering pedicel but shorter than the fruiting one. Perianth 1¼ to 1½ in. long, narrower and more gradually tapering to the base than in the other species, the lobes broad, about 3 lines long. Filaments adnate to far above the middle of the corolla tube. Capsule 1 to 1½ in. long, tapering into a stipes often 1 in. long.—F. Muell. Fragm. vii. 71; *Aletris punicea*, Labill. Pl. Nov. Holl. i. 85, t. 111; *B. grandiflora*, Hook. f. Fl. Tasm. ii. 49; Baker in Journ. Linn. Soc. xi. 365, not of R. Br.; *B. Backhousii*, Lindl. Bot. Reg. 1845 under t. 18; *B. intermedia*, Herb. in Bot. Reg. 1845, Misc. 64.

Tasmania. Not uncommon in various parts of the island, ascending to 4000 ft. *J. D. Hooker* and many others.

2. **B. grandiflora,** *R. Br. Prod.* 296.—A tall handsome species, with the many-flowered crowded racemes of *B. marginata*, and the bracts often nearly as long though broader. Lower leaves long as in that species but narrower, the short upper sheathing leaves ending in erect almost subulate points. Perianth fully 2 in. long, red at the base but the yellow apex usually extending to ⅓ of its length, the lower part narrow to nearly ½ its length, then much expanded, the lobes broadly ovate and fully ½ in. long. Stamens attached below the middle of the perianth.—Paxt. Mag. vii. 219 with a plate; *B. Cunninghamii*, Lindl. Bot. Reg. 1845 under t. 18; Bot. Mag. t. 5734; Baker in Journ. Linn. Soc. xi. 365.

N. S. Wales. Elevated peaty bogs in the Blue Mountains, *A. Cunningham*, *C. Moore*; Hunter's River, *R. Brown*.

Var. *elongata*. Stems tall, the lower leaves probably very long but wanting in our specimens, upper sheaths ending in subulate points of 6 to 8 in. Peduncles much exceeding the bracts. Perianth 2 to 2½ in. long, with the long narrow base, broad apex, and deep lobes of the typical form. Anthers rather long and almost exceeding the corolla.

Blue Mountains, *C. Moore*.

3. **B. nobilis,** *Sm. Exot. Bot.* i. 5, t. 4. Stems attaining sometimes 2 or 3 ft. but not so stout as in the preceding species. Leaves long and narrow, in the wild specimens not much above 2 lines broad, but often broader when cultivated. Flowers often only 4 or 5 in the raceme, although occasionally twice as many, the pedicels 2 or 3 times as long as the bracts even at the time of flowering. Perianth 1 to 1¼ in. long, of a brownish-red, the upper part yellow, and at first with a green tip, narrow at the base, somewhat abruptly dilated at about the middle, but scarcely broader or sometimes slightly contracted at the throat, the lobes shorter than broad and usually very obtuse. Stamens adnate to about the middle of the perianth or sometimes free rather lower down.—R. Br. Prod. 296; Baker in Journ. Linn. Soc. xi. 365; F. Muell. Fragm. vii. 70; Bot. Reg. t. 286; Bot. Mag. t. 2003; Endl. Iconogr. t. 27.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 195 and many others.

B. grandiflora, Bot. Reg. t. 924, but not of R. Br., appears to me to be a variety of *B. nobilis*, with the flowers rather broader than usual, but neither tapering to the base as in *B. marginata*, nor with the very wide throat of *B. grandiflora* and *B. flammea*. The scabrous or minutely serrated margins of the leaves by which some of the species of *Blandfordia* have been distinguished are not constant in any one of them.

4. **B. flammea,** *Hook. Bot. Mag. t.* 4819.—A tall species, with the narrow foliage and usually few flowers and short bracts of *B. nobilis*, but the flowers much larger and differently shaped. Perianth usually above 1½ in. long, much dilated almost from the base and very broad upwards, so as to be almost campanulate, the lobes short broad and obtuse, the colour usually a rich brown-red in the lower part, the broad upper portion from yellow to orange, but sometimes yellow or orange almost or quite from the base.—Baker in Journ. Linn. Soc. xi. 366; Lindl. in Paxt. Mag. Bot. xvi. 353, with a plate; Fl. des Serres, t. 585; *B. Cunninghamii*, Fl. des Serres, t. 1829, but not of Lindl.

N. S. Wales. Port Macquarrie, *Backhouse*; Tweed River, *C. Moore*; Hastings River, *Beckler*; Richmond River, *Henderson*, *Mrs. Hodgkinson*; New England, *C. Stuart*.

B. aurea, Hook. Bot. Mag. t. 5809, Baker in Journ. Linn. Soc. xi. 366, appears to me to be a variety of *B. flammea*, with the perianth yellow from the base. Of the var. *princeps* figured Bot. Mag. t. 6209, we have no specimen; the perianth is represented as large as that of *B. grandiflora*, but shaped as in *B. flammea*, of which it has also the loose raceme and short bracts.

Tribe 8. Melanthaceæ. Perianth-segments free or shortly united at the base, rarely to the middle. Style more or less divided into 3 stigmatic branches or short distinct styles. Stock not at all or scarcely bulbous. Anthers frequently turned outwards.

13. **HEWARDIA,** Hook.

Perianth divided nearly to the base into 6 petal-like deciduous spreading segments, all nearly equal and similar, the very short persistent base adnate to the base of the ovary. Stamens 3, attached to the base of the inner segments and much shorter than them; filaments short, dilated below the middle; anthers erect, sagittate, the cells opening outwards in longitudinal slits. Ovary sessile, 3-celled, with numerous ovules superposed in 2 rows in each cell; style short, with 3 recurved stigmatic lobes. Capsule oblong, coriaceous, opening loculicidally in 3 valves, leaving a persistent central placentiferous columella. Seeds unknown. —Perennial with the equitant leaves distichous and crowded at the base of the stem as in *Irideæ*. Stem simple, with a single rather large terminal flower.

The genus is limited to the single Tasmanian species. It has all the characters of *Irideæ*, except that the ovary is superior, adnate only by the very short base, and it ought perhaps to be referred to that order as an exceptional genus.

1. **H. tasmanica,** *Hook. Ic. Pl. t.* 858.—Stock densely tufted. Leaves chiefly radical, the sheaths distichous, imbricated and acutely keeled, the blade vertically flattened, rigid, erect, acute, mostly about 3 in. long and 2 lines wide, but in some luxuriant specimens 8 or 9 in. long and 3 lines wide. Stem 6 in. to 1 ft. high, with 2 or 3 distant sheathing short leaves, more membranous than the radical ones, and the 2 uppermost usually close together, 1 to 1½ in. long, forming a double sheath enclosing the pedicel. Flower solitary, terminal, on a pedicel shorter than the perianth but often lengthening after flowering. Perianth purple, the segments lanceolate, acuminate, 1 to 1½ in. long. Stamens less than half as long. Style deciduous. Capsule only seen half-grown with a single old one about ½ in. long, open with the seeds all fallen away.—Hook. f. Fl. Tasm. ii. 47; F. Muell. Fragm. vii. 72.

Tasmania. Heathy plains and mountain ranges near Macquarrie Harbour, *Milligan*, *Gunn*; summit of Mount Lapeyrouse, *Oldfield*, *C. Stuart*; alpine regions of Mount Field East, *F. Mueller*; Arthur's Range and Lake Pedder, *Johnstone*.

14. **MILLIGANIA,** Hook. f.

Perianth persistent, divided nearly to the base into 6 membranous irregularly 3-nerved lobes, all equal and similar. Stamens 6, attached to the base of the lobes and shorter than them; filaments slightly flattened; anthers ovate, erect or scarcely versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell superposed in 2 rows; style more or less deeply divided into 3 lobes stigmatic at the end. Capsule membranous with 3 laterally prominent lobes or angles, opening loculicidally at the apex in 3 valves. Seeds several, narrow, often somewhat curved, with a hooked terminal appendage; testa black, crustaceous, shining; albumen fleshy; embryo linear, central or nearly so.—Densely tufted rather tall or dwarf plants, the stem inflorescence and sometimes the leaves more or less clothed or sprinkled with loose almost woolly hairs. Leaves chiefly radical, long and very prominently nerved. Stems erect, shortly leafy at the base. Flowers numerous in a terminal panicle, shortly pedicellate along its branches, or rarely few in a short corymb each within a single bract, and usually hermaphrodite.

The genus is limited to Tasmania. With something of the habit of *Astelia*, the characters are more nearly those of *Anguillaria*.

Perianth enclosing the fruit. Stamens very short. Style very short, conical, deeply 3-lobed.
  Panicle dense. Flowers almost sessile . . . . 1. *M. densiflora.*
  Panicle loose. Flowers distinctly pedicellate . . . . . 2. *M. longifolia.*
Perianth enclosing the fruit. Style and stamens of *M. stylosa.* Dwarf plant, with a corymb of less than 6 flowers . . . . 3. *M. Johnstoni.*
Perianth reflexed under the small fruit. Stamens more than half as long as the perianth. Style filiform, longer than the ovary, shortly 3-lobed at the apex. Panicle many flowered . . . . 4. *M. stylosa.*

1. **M. densiflora,** *Hook. f. Fl. Tasm.* ii. 62.—Very near *M. longifolia*, but the leaves are shorter, broader, more rigid, the panicle narrow and compact, 6 to 8 in. long. Flower crowded on the short branches and very nearly sessile, the perianth larger than in *M. longifolia*, the lobes 5 or even 6 lines long. Stamens very short.

Tasmania. Mount Sorrel, Macquarrie Harbour, *Milligan*; Mount Lapeyrouse, *Oldfield*.

2. **M. longifolia,** *Hook. f. in Hook. Kew Journ.* v. 296, *t.* 9, *Fl. Tasm.* ii. 61.—Radical leaves 1 to 2 ft. long, with long broad sheathing bases, the blade often ½ in. broad, tapering at the end into a long point. Stems 1 to 2 ft. high, with 2 or 3 leaves in the lower part shorter than the radical ones, the greater part occupied by an ample panicle, the rhachis more or less woolly hairy. Bracts rather large and leafy under the principal branches, membranous and usually longer than the pedicel under each flower. Flowers pedicellate along the branches, forming loose racemes. Perianth about 3 to 3½ lines long, the lobes oblong, obtuse, about 3 times as long as the undivided base. Style short and thick, often persistent but splitting into 3 2-lobed styles terminating the 3 valves. Capsule about 2 lines long and not quite so broad. Seeds ascending or the lower ones pendulous, narrow-oblong, with a very prominent hooked point, the hilum end also shortly incurved.

Tasmania. Franklin River, *Gunn*; Macquarrie Harbour, *Milligan*.

3. **M. Johnstoni,** *F. Muell. Herb.*—A dwarf plant, the stems 1 to 3 in. long, covered with the broad leaf-sheaths, some of the older ones split into filaments. Blade of the leaves lanceolate, acute, not above

1 in. long. Flowers 3 to 6, in a little corymb about as long as the leaves, the pedicels short, each one in the axil of a leafy bract not longer than the perianth. Perianth about 4 lines long, divided to about the middle into narrow-oblong lobes, the tube broad, very shortly adnate at the base. Stamens shortly exserted from the tube; anthers ovate-oblong. Style slender, about as long as the ovary, very shortly 3-lobed at the apex. Capsule shorter than the tube, the angles scarcely prominent but opening readily in 3 slits, although not quite ripe in the specimens seen.

Tasmania. Alpine country on the Huon River, *R. Johnston*.

4. **M. stylosa,** *F. Muell. Herb.*—Radical leaves 6 in. to above 1 ft. long and ¾ to 1 in. broad in the broadest part, but rapidly tapering to a long point. Stems stout, 1 to 1½ ft. high, the loose wool of the inflorescence much shorter than in *M. longifolia*. Panicle rather dense, with numerous flowers, and a few broad leafy bracts of 1 in. or more under the principal branches, the bracts under the pedicels rarely exceeding the perianths. Flowers racemose along the branches, on pedicels of 2 to 4 lines long. Perianth-segments narrow, about 2 lines long, reflexed under the fruit. Stamens rather shorter than the perianth, with small ovate anthers. Ovary depressed-globular, the ovules rather numerous; style subulate, at least as long as the ovary, shortly but distinctly 3-lobed at the apex. Capsule not 2 lines diameter, with 3 obtuse prominent angles, the pericarp rather thick but opening readily at the angles although not quite ripe in our specimens. Seeds few, black, angular, but variously shaped.—*Astelia stylosa*, F. Muell. in Hook. f. Fl. Tasm. ii. 61.

Tasmania. Summit of Mount Lapeyrouse, where it forms dense masses, *Oldfield*, *C. Stuart*. The hermaphrodite flowers and capsular fruit place this plant undoubtedly in *Milligania* and not in *Astelia*.

15. WURMBEA, Thunb.

Perianth persistent, divided to the middle or more deeply into 6, rarely 8, spreading lobes or segments all equal and similar. Stamens 6, rarely 8, attached to the base of the lobes or segments and shorter than them; filaments filiform, usually dilated at the base; anthers ovate, erect or almost versatile, the cells opening laterally or almost outwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell; styles 3, filiform, recurved, stigmatic along the inner edge from the base or towards the end. Capsule prominently 3-angled, truncate at the top, opening loculicidally in 3 valves. Seeds globular, the testa thin brown and appressed, albumen fleshy, rather hard. Embryo small, near the hilum.—Small herbs, the base of the stem and persistent brown leaf-sheaths thickened into a narrow tunicated bulb. Leaves few, ovate lanceolate or linear. Flowers either solitary and terminal or in a terminal spike, sessile along the rhachis, hermaphrodite or sometimes polygamous. Bracts none.

Besides the four Australian species which are endemic in the south-western districts, there are several from South Africa.

Leaves ovate or lanceolate. Spikes dense. Perianth 6-lobed.	
Perianth-segments united to the middle, 7 to 9 lines long	1. *W. tubulosa.*
Perianth-segments united to $\frac{1}{4}$, 3 to 4 lines long . . .	2. *W. Drummondii.*
Leaves linear or linear-lanceolate. Spikes few-flowered. Perianth-segments 6, united to $\frac{1}{5}$.	3. *W. pygmæa.*
Leaves almost filiform. Flowers solitary. Perianth-segments 8, very shortly united	4. *W. tenella.*

1. **W. tubulosa,** *Benth.*—Bulb and lower leaves unknown; upper leaf broadly lanceolate, contracted at the base and tapering into a long point. Spike dense, of above 10 flowers. Perianth 7 to 9 lines long, the segments united to near the middle into a narrow tube; lobes acute, without transverse glands. Stamens attached to the base of the lobes, much shorter than them, with small anthers. Ovary in the flower examined narrow, probably imperfect, with 3 long filiform styles.

W. Australia. Champion Bay, *Herb. F. Mueller*, where there are only two spikes, but the peculiar flowers do not admit of referring them to any other species; the perianth-tube is indeed longer than in any African one except *W. longiflora.*

2. **W. Drummondii,** *Benth.*—A dwarf plant, none of our specimens exceeding 4 in. Bulb tunicated, shining. Leaves 2 or 3, ovate or lanceolate, acute but not acuminate, 1 to 1$\frac{1}{4}$ in. long in our specimens and 3 to 6 lines broad at the base. Flowers in a rather dense spike, polygamous and usually small, but the perianth varying from under 3 to above 4 lines in length, the segments united to about $\frac{1}{4}$ of their length. Stamens attached to the base of the lobes and shorter than them: anthers small, shortly ovate. Styles scarcely longer than the ovary.

W. Australia. Swan River, *Drummond*, 1st *coll.*

3. **W. pygmæa,** *Benth.*—Nearly allied to *W. Drummondii* and stature as small, but the leaves much narrower, linear or linear-lanceolate, contracted at the base, flowers smaller, fewer in the spike, often only 1 or 2, perianth-segments 6 (or very rarely a 7th) scarcely united to above $\frac{1}{5}$ of their length, of a rather thick consistence, and glandular-dotted outside.—*Anguillaria pygmæa*, Endl. in Pl. Preiss. ii. 45.

W. Australia. Swan River, *Drummond*, 1st *coll.*, *Preiss*, *n.* 1599.

4. **W. tenella,** *Benth.*—A small slender plant, resembling at first sight the slender 1-flowered specimens of *Anguillaria dioica*, the stem almost filiform, with usually 1 long filiform leaf and 1 or 2 shorter ones scarcely dilated at the base. Flowers solitary and terminal in all the specimens seen. Perianth-segments almost always 8, very spreading, narrow, about 3 lines long, with an orbicular gland about the middle, all shortly united at the base. Stamens shorter than the perianth, the filaments much dilated and united in a ring at the base; anthers small.

Styles scarcely longer than the ovary.—*Anguillaria tenella*, Endl. in Pl. Preiss. ii. 45.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1598; Greenough Flats, *C. Gray.*

16. ANGUILLARIA, Br.

Perianth persistent, of 6 distinct spreading segments, all equal and similar. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments filiform, dilated towards the base; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, distinct or united at the base, shortly filiform, recurved, stigmatic along the inner edge at least towards the end. Capsule prominently 3-angled, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy, rather hard. Embryo small, near the hilum.—Small herbs, the base of the stem and persistent brown leaf-sheaths thickened into a narrow tunicated bulb. Leaves few, linear, the uppermost reduced to a broad loose sheath and short lamina or point. Flowers often more or less diœcious, either solitary and terminal or sessile along the rhachis of a simple spike. Bracts none.

The genus is limited to the two species endemic in Australia. It only differs from *Wurmbea* in the perianth-segments distinct from the base.

Perianth-segments without any transverse gland. Styles shortly united at the base	1. *A. densiflora.*
Perianth-segments with a transverse single or double gland below the middle. Styles distinct from the base . . .	2. *A. dioica.*

1. **A. densiflora,** *Benth.*—Bulb copiously tunicated. Stems about 6 in. high and leaves as in *A. dioica*, but the upper one less dilated at the base. Flowers 3 to 6, in a close terminal flexuose spike, hermaphrodite in the specimens seen. Perianth-segments 4 to 5 lines long, less spreading from the base than in *A. dioica*, scarcely imbricate, without any transverse gland. Stamens nearly as long as the perianth, the filaments slightly dilated at the base, anthers narrow-oblong. Styles filiform, considerably longer than the ovary, very shortly united at the base.

W. Australia. Murchison River, *Oldfield*; Greenough Flats, *C. Gray.*

2. **A. dioica,** *R. Br. Prod.* 273.—Bulb tunicated. Stem varying from 2 or 3 in. to nearly 1 ft. high. Leaves few, the lowest reduced to brown elongated sheaths, perfect ones usually 3 or 4, linear, varying from 1 to 3 or even 4 in. long, the lowest sometimes narrow from the base, the others more or less dilated at the base into a broad loose sheath, the uppermost often reduced to the broad base with a short point or only acute, and therefore sometimes called a spatha. Flowers either solitary and terminal or 1, 2 or more sessile along the simple rhachis which is often flexuose, polygamous, the strictly female ones

without staminodia generally on a separate plant, the males and hermaphrodites usually in one spike. Perianth-segments oblong or linear, 3 to 6 lines long, bearing below the middle on the upper surface a transverse gland sometimes broken up into 2. Styles shortly filiform, distinct from the base. Capsule ovate or oblong, truncate at the top, 4 to 5 lines long.—Endl. in Pl. Preiss. ii. 44; Hook. f. Fl. Tasm. ii. 46; Endl. Iconogr. t. 3; *A. biglandulosa* and *A. uniflora*, R. Br. Prod. 273; *A. monantha*, Endl. in Pl. Preiss. ii. 45; *A. australis*, F. Muell. Fragm. vii. 74; *Pleea Sieberi*, Reichb. in Sieb. Pl. Exs.; *Melanthium Brownii*, Schlecht. Linnæa, i. 86.

Queensland. Moreton Bay, *Leichhardt*; Warwick, *Beckler*; Darling Downs, *Woolls*; Armidale, *Perrott*; Rockhampton, *O'Shanesy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 156, and many others; northward to New England, *C. Stuart*; Clarence River, *Wilcox*; Richmond River, *Henderson*.

Victoria. Wendu Vale, *Robertson*; about Melbourne, *Adamson*, *F. Mueller*, and others.

Tasmania. Port Dalrymple, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*; Mount Gambier, *Mrs. Wehl*; Yorke Peninsula, *Fowler*; in the interior from Lake Eyre to the River Finke, *Giles*.

W. Australia. From King George's Sound to Swan River, *Drummond*, 1*st coll.*, *n.* 784, 785, 786, *Preiss*, *n.* 1598, 1600, 1602, 1603, and many others; Murchison River, *Oldfield*.

An exceedingly variable species, of which I have found it impossible to distribute the numerous specimens before me, from very varied localities, into distinct races, either by general size or by that of the perianth, by the more or less spathiform upper leaves, by the number of flowers, 1, 2 or more in the spike, by the colour of the segments described as yellow, with or without a purple margin, or almost wholly purple, or by the union or distinctness of the glands on their surface.

17. IPHIGENIA, Kunth.

Perianth deciduous, of 6 distinct spreading segments, all equal and similar. Stamens 6, hypogynous, very much shorter than the perianth; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, very shortly united at the base, recurved, stigmatic along the inner edge. Capsule less angular than in *Anguillaria*, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy. Embryo small, near the hilum.—Herbs forming a small tunicated bulb, the stem simple, with few narrow leaves. Flowers few, on long pedicels, or sessile in a species not Australian.

Besides the Australian species, which is widely distributed over East India, there are one or two others from East India, and one in New Zealand. The genus is closely allied to *Anguillaria*, and was included in it by R. Brown, differing from it chiefly in the separately deciduous perianth-segments and stamens. Kunth places it in a different Order, as having the anthers introrse, not extrorse. I have failed to detect this difference: in both cases the cells appear to me in the bud to be strictly lateral, placed back to back, the filament attached in the emarginate base of the

anther, and when the flower is expanded the anther becomes versatile, with the attachment, if not basal, rather dorsal than towards the inner face.

1. **I. indica,** *Kunth, Enum.* iv. 213.—Stems simple, about 1 ft. high in the Australian specimens, slender, with a few rather long linear or linear-lanceolate leaves, sheathing at the base. Flowers few, at the end of the stem, on rather long slender pedicels, subtended, at least the lower ones, by leafy bracts. Perianth purple or red, the segments narrow-linear, about 3 lines long in the Australian specimens, longer in some Indian ones. Capsule ovoid or oblong, 4 to 5 lines long.—F. Muell. Fragm. vii. 74; *Anguillaria indica*, R. Br. Prod. 273; Wall. Pl. As. Rar. iii. t. 259.

N. Australia. Arnhem N. bay and islands of the coast, *R. Brown;* Sea Range, *F. Mueller.*

Queensland. Rockhampton and adjoining districts, *Bowman, O'Shanesy;* Rockingham Bay, *Dallachy.*

18. SCHELHAMMERA, Br.

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the segments and shorter than them; filaments thick or flattened, tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, prominently 3-angled, 3-celled, with several ovules superposed in 2 rows in each cell; style more or less deeply divided into 3 recurved lobes stigmatic along the inner edge. Capsule nearly globular, with an almost fleshy pericarp, opening loculicidally in 3 valves. Seeds irregularly ovoid-globular, the funicle expanded into a broad irregular strophiole; testa very thin, light brown, closely appressed; albumen rather hard. Embryo very small, near the hilum.—Perennials, with fibrous roots and simple or branched stems. Leaves sessile, ovate or lanceolate. Flowers terminal, pedicellate, solitary or several together in an umbel sessile within the last leaves.

The genus is limited to Australia.

Leaves with minutely undulate margins. Flowers solitary or rarely 2 together . . . . 1. *S. undulata.*
Leaves quite entire. Flowers usually above 10 in the umbel . 2. *S. multiflora.*

1. **S. undulata,** *R. Br. Prod.* 274.—Fibrous roots often swollen into small tubers. Stems slender, diffuse and branching at the base, ascending or erect, rarely much above 6 in. high. Leaves ovate-lanceolate, varying however in breadth, 1 to nearly 2 in. long, membranous, with slightly prominent nerves, the margins minutely undulate. Flowers pale lilac, solitary or rarely 2 together at the ends of the branches, on pedicels of ½ to 1 in. without bracts. Perianth-segments usually about 4 lines long, oblong, almost acute, either wholly flat when fully out or

remaining concave at the base. Ovules 4 to 6 in each cell.—F. Muell. Fragm. vii. 71; Bot. Mag. t. 2712.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; Newcastle, *Leichhardt*; Illawarra, *A. Cunningham*; Cape Howe Ranges, *Walter.*

2. **S. multiflora,** *R. Br. Prod.* 274.—Stems from a knotted rhizome, rather more rigid than in *S. undulata*, simple or branched, mostly 6 in. to nearly 1 ft. high. Leaves of the size of those of *S. undulata* but rather firmer, not so broad at the base and almost shining with the margins quite entire, several of the upper ones close together forming an involucre round the umbel. Flowers pure white, several (usually above 10) together in a terminal umbel sessile within the last leaves, with sometimes a few minute bracts at the base of the pedicels besides the involucral leaves. Pedicels filiform, ¾ to 1 in. long. Perianth-segments about 4 lines long as in *S. undulata*, but rather more rigid. Ovules usually 4 in. each cell; seeds only 1 or 2.—F. Muell. Fragm. vii. 72.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Cape York Peninsula, *Hann's Expedition*, n. 367; Cape York, *Daemel.*

19. KREYSIGIA, Reichb.

(Tripladenia, *Don.*)

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower as in *Schelhammera*, but bordered on each side near the base by a glandular appendage. Stamens 6, attached to the base of the segments and shorter than them; filaments tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, 3-angled, 3-celled, with 3 or 4 ovules in each cell; style deeply divided into 3 recurved lobes stigmatic along their inner edge. Capsule nearly globular, opening loculicidally in 3 valves. Seeds, according to Don, strophiolate, the embryo not completely enclosed in the albumen, but only covered by the strophiole. Perennial with a knotty rhizome and the simple stems and ovate or lanceolate leaves of *Schelhammera*, but the flowers axillary on a slender peduncle.

The genus is limited to the single species endemic in Australia; the structure of the seed requires further examination. It has only been described by Don, and those of our specimens are all fallen away from the capsules.

1. **K. multiflora,** *Reichb. Iconogr. Exot.* iii. 11, *t.* 229.—Stems from a knotty rhizome, ascending or erect, simple, flexuose, ¾ to 1½ ft. high. Leaves ovate or ovate-lanceolate, clasping the stem by their cordate base, acute, 2 to 3 in. long, with numerous prominent nerves connected by transverse veinlets. Peduncles axillary, bearing at their apex 1, 2 or rarely 3 flowers on filiform pedicels, with 3 or 4 linear bracts at the base of the pedicels and shorter than them, the whole inflorescence usually shorter than the leaves. Perianth-segments ovate or oblong,

about 4 lines long, but varying in size, the lateral appendages at their base either dilated or 2- or 3- or even 4-lobed at their glandular apex. Capsule 3 or 4 lines diameter.—Bot. Mag. t. 3905; F. Muell. Fragm. vii. 71; *Schelhammera multiflora*, Lodd. Bot. Cab. t. 1511, not of Br.; *Tripladenia Cunninghamii*, Don in Proc. Linn. Soc. 1839. 46, Ann. Nat. Hist. ser. 1. iv. 282.

Queensland. Pine River and Moreton Bay, *F. Mueller.*

N. S. Wales. Hastings River, *Fraser, A. Cunningham, Beckler;* Richmond River, *C. Moore, Henderson,* and others; Macleay River, *Guilfoyle;* Tweed River, *Fitzgerald;* Clarence River, *Wilcox.*

20. BURCHARDIA, R. Br.

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the perianth-segments and shorter than them; filaments flattened towards the base; anthers linear-oblong, attached near the base, the cells opening outwards in longitudinal slits. Ovary sessile but tapering at the base, prominently 3-angled, 3-celled, with numerous ovules superposed in 2 rows in each cell; style short, with 3 recurved stigmatic lobes. Capsule oblong or ovoid, deeply 3-furrowed and obtusely 3-angled, opening septicidally in 3 valves, with marginal placentæ. Seeds angular, with a brown thin adnate testa. Embryo small, in a fleshy albumen, not far from the hilum.—Herb with a fibrous root, and simple or slightly branched stem, with few narrow leaves not distichous. Flowers in a terminal umbel, a few outer bracts forming a small involucre.

The genus is limited to the single Australian species.

1. **B. umbellata,** *R. Br. Prod.* 273.—Stem enclosed at the base in a few brown sheaths of old leaves but not bulbous, 1 to 2 ft. high, usually simple but occasionally with 1 or 2 erect branches. Leaves 1 to 3 at the base of the stem, narrow-linear, concave, 3 to 6 in. long, with a sheathing base, the upper leaves few, much shorter or reduced to sheathing bracts. Flowers several often numerous in the umbel, irregularly sometimes partially centrifugally developed, varying however in number as well as size, each one in the axil of a small bract, 2 or 3 of the outer bracts often larger forming an involucre but always much shorter than the pedicels, which vary in length from a few lines to 2 in. Perianth-segments white, oblong or elliptical, usually about 4 lines, but varying from 3 to 6 lines long. Capsule when full grown attaining about ½ in.—Hook. f. Fl. Tasm. ii. 46; Endl. in. Pl. Preiss. ii. 44; *B. multiflora* and *B. congesta*, Lindl. Swan Riv. App. 58; Endl. l.c.

N. S. Wales. Port Jackson, *R. Brown, Sieber, n.* 153, 154, and others; northward to Hastings River, *Beckler;* Richmond River, *Henderson;* southward to Illawarra. *A. Cunningham.*

Victoria. Wendu Vale, *Robertson;* Port Phillip, *Gunn;* about Melbourne. *Adamson, F. Mueller.*

Tasmania. Northern parts of the island, *Gunn* and others.

S. Australia. Very abundant from St. Vincent's Gulf to the Murray, *Behr*, *F. Mueller*, and others; Port Lincoln, *Wilhelmi.*

W. Australia. From King George's Sound to Swan and Murchison Rivers, *Drummond*, 1*st coll. and n.* 783; *Preiss*, *n.* 1604, 1607, 1608, and others.

The variations in the size of the flowers are nearly equally observable in all the colonies; some of the Swan River specimens are in every respect the most luxuriant, but others again are as starved and small-flowered as any eastern ones.

TRIBE 9. ANTHERICEÆ. Perianth segments free or very shortly united at the base. Style undivided, with a small terminal entire or slightly 3-dymous stigma. Stock not bulbous. Flowers racemose, paniculate or umbellate, rarely solitary. Bracts thinly scarious usually hyaline or none, not glume-like.

21. BULBINE, Linn.

Perianth deciduous, of 6 equal segments, free or slightly connected at the base. Stamens 6, attached to the base of the perianth, and shorter than its segments; filaments filiform or shortly dilated at the base, bearded above the middle by a dense tuft of filiform or clavate hairs; anthers oblong-linear, usually recurved or twisted after shedding the pollen, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule nearly globular, 3-valved. Seeds few, angular, black, the testa opaque, smooth or tubercular-granulate.—Perennials, with fibrous roots proceeding sometimes from a thick tuber under the stock. Leaves radical or crowded at the base of the stem, with short sheaths. Scape simple, leafless, ending in a simple raceme of yellow flowers, the pedicels solitary within a scarious bract, and articulate immediately under the flower.

Besides the two species endemic in Australia, there are a considerable number natives of South Africa.

Perianth usually about ½ in. long or more. All the filaments
bearded. Root often tuberous . . . . 1. *B. bulbosa.*
Perianth about ¼ in. Only the 3 inner filaments bearded.
No tuber to the root . . . . 2. *B. semibarbata.*

1. **B. bulbosa,** *Haw. Rev. Pl. Succ.* 33.—Root in old plants forming a bulb-shaped tuber immediately under the stock, but not really bulbous. Leaves all radical, linear-subulate, rather thick, grooved in front, from under 6 in. to above 1 ft. long, with very short sheathing bases. Scapes 1 to 2 ft. high, the raceme when fully out often above 6 in. long. Scarious bracts varying from very short to half as long as the pedicels. Pedicels erect, rarely longer than the flower when first out, but lengthening more or less after flowering. Perianth-segments oblong, usually 5 to 6 lines long, but sometimes at least 8 lines, yellow, with a narrow dark obscurely 3-nerved centre. Filaments all equal or the inner ones longer, the tuft of hairs sometimes very short immediately under the anther or

rather below it, sometimes occupying the upper half of the filament with the anther almost buried in it; but I have always seen the anther itself quite glabrous, usually shorter than the filament. Capsule erect, about 3 lines diameter, ripening 1 or 2 seeds in each cell.—Baker in Journ. Linn. Soc. xv. 345; Hook. f. Fl. Tasm. ii. 51; F. Muell. Fragm. vii. 70; *Anthericum bulbosum*, R. Br. Prod. 275; Bot. Mag. t. 3017; *A. semibarbatum*, Hook. Bot. Mag. t. 3129, not of R. Br.; *Bulbine australis*, Spreng. Syst. ii. 86; *B. suavis*, Lindl. in Bot. Reg. 1838, Misc. 15; *B. Fraseri* and *B. Hookeri*, Kunth, Enum. iv. 565, 566.

Queensland. Moreton Bay, *F. Mueller*; Condamine River, *Leichhardt*; Darling Downs, *Woolls*; Curriwillighie, *Dalton*; Burnet River, *Haly*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; northward to New England, *C. Stuart*; Clarence River, *Beckler*; in the interior from the Darling to the western frontier, *Dallachy*, *Mitchell*, and others.

Victoria. From the Glenelg and lower Yarra, *Robertson*, *Adamson*, *F. Mueller*, and others, to Wimmera, *Dallachy*.

Tasmania. Abundant in rocky places throughout the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*; Yorke Peninsula, *Miss Salmon*.

Some specimens from the islands of Bass's Straits, *Wilhelmi*, and Mount Buller, *F. Mueller*, show a very large variety, with long, thick succulent leaves. Some of the northern ones are small and slender, with narrow leaves, and the beard of the filaments smaller than usual; the hairs of the beards are, however, very variable in length, number, and density, and in the greater or less admixture of clavate hairs. The figure in Bot. Mag. t. 3017, representing the anthers as well as the filaments hairy in their whole length, must have been a mistake, as they are not so in the typical specimen preserved. The description was probably drawn up in that respect from the plate.

Some specimens sent by Gunn, as gathered in a shrubbery near Georgetown, with a note that they possibly have been introduced, appear to be the *B. longiscapa*, Willd., a South African species long cultivated in European gardens.

2. **B. semibarbata,** *Haw. Rev. Pl. Succ.* 33.—Roots fibrous, without any tubers under the stock. Leaves usually narrow-linear, but varying in length almost as much as in *B. bulbosa*. Scapes from a few in. to about 1 ft. high, the racemes looser and the flowers fewer and smaller than in *B. bulbosa*. Perianth rarely above 3 lines long, and the pedicels usually longer. Stamens 3 opposite the outer segments almost hypogynous, the filaments short without beards, 3 attached to the base of the inner segments with much longer filaments bearded above the middle or immediately under the anther, as in *B. bulbosa*. Capsule rarely above 2 lines diameter, ripening 3 or 4 black angular seeds, often coarsely reticulate or tuberculate on the angles.—Baker in Journ. Linn. Soc. xv. 349; Hook. f. Fl. Tasm. ii. 52; F. Muell. Fragm. vii. 70; *Anthericum semibarbatum*, R. Br. Prod. 275; *Bulbine floribunda*, Schrad. in various Botanical Gardens; *Triglochin racemosum*, Endl. in Pl. Preiss. ii. 54.

Queensland. Moreton Bay, *C. Stuart*; Ballandool River, *Locker*.

N. S. Wales. In the interior at Nangas, *M^cArthur*; Darling River, *Mrs. Forde*; Upper Bogan and Lachlan Rivers, *L. Morton*; Stokes Range to Cooper's Creek, *Wheeler*.

Victoria. Generally distributed over the colony, *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown*; common in moist and marshy places in various parts of the island, *J. D. Hooker.*

S. Australia. Memory Cove, *R. Brown*; round St. Vincent's Gulf, *F. Mueller* and others; Yorke Peninsula, *Fowler*; Kangaroo Island, *R. Brown*, *F. Mueller.*

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *F. Mueller*, and many others; Blackwood River, *Oldfield*; Lake Muir, *Muir*; Rottenest Island, *Preiss, n.* 2407.

22. AGROSTOCRINUM, F. Muell.

Perianth with a campanulate persistent base, articulate above the ovary, with 6 oblong spreading 5-nerved segments, spirally twisted after flowering, and at length deciduous. Stamens 6, hypogynous, slightly declinate, shorter than the perianth; filaments short, glabrous, scarcely flattened; anthers linear, longer than the filaments, opening in terminal pores. Ovary sessile, 3-celled, with 2 collateral erect ovules in each cell; style filiform, with a small terminal stigma. Capsule nearly globular, surrounded by the truncate persistent base of the perianth, 3-valved. Seeds 1 or 2 in each cell; obovoid or nearly globular, with a small fugacious strophiole; testa crustaceous, black, smooth and shining.—Stems erect, with narrow leaves not crowded. Flowers blue in a loose terminal raceme, with a minute bract under each pedicel.

The genus is limited to the single species endemic in West Australia.

1. **A. stypandroides,** *F. Muell. Fragm.* ii. 95, vii. 65.—Stems erect, simple, often 2 to 3 ft. high, glabrous below, but more or less scabrous-hirsute under the inflorescence. Leaves narrow-linear, with rather long sheaths, quite closed round the stem, and flattened with an acute keel. Flowers blue and showy, the raceme simple or once branched. Pedicels filiform, rather distant, often above 1 in. long, usually scabrous-hirsute as well as the rhachis. Perianth 6 to 8 lines long, the campanulate persistent base about 1 line long when in flower, 2 lines long round the fruit, the segments all 5-nerved, and equal in length, the outer ones more opaque, with narrow margins, the inner ones with broad nerveless margins. Capsule about 2 lines diameter.—*Stypandra scabra*, R. Br. Prod. 279; Endl. in Pl. Preiss. ii. 35; *Cæsia hirsuta*, Lindl. Swan Riv. App. 57; *Cæsia scabra*, Baker in Journ. Linn. Soc. xv. 359; *Arthropodium scabrum*, Spreng. Syst. ii. 87.

W. Australia. Lucky Bay, *R. Brown*; King George's Sound to Swan River, *A. Cunningham*, *Drummond*, 1st *Coll. and No.* 775, 776, *Preiss*, *n.* 1538, *Oldfield* and others; eastward to Cape Arid and Cape Paisley, *Maxwell.* Sent by F. Barlee, with a long leafy form of *Stypandra glauca*, as the plant called *blind grass*, because it is supposed to cause blindness in cattle and sheep that eat of it.

23. THYSANOTUS, R. Br.

(Chlamyspermum, *Salisb.*)

Perianth spirally twisted over the ovary after flowering, but sometimes at length deciduous, of 6 distinct segments, all nearly equal in

length, with an opaque 3-nerved centre, the 3 outer usually narrow, acute with narrow thin entire margins, the 3 inner with broad coloured margins, rolled inwards over the inner stamens in the bud, and elegantly fringed on the edges. Stamens 3 opposite the outer segments hypogynous or sometimes wanting, 3 attached to the base of the inner segments, all more or less declinate in the expanded flower, shorter than the perianth; filaments short or rarely nearly as long as the anthers; anthers linear, the parallel cells confluent at the apex and opening longitudinally, the inner valve shorter and narrower than the outer one, those of the inner stamens usually longer than the others, and often terminating in a long narrow beak. Ovary sessile or contracted into a short thick stipes, 3-celled, with 2 superposed ovules in each cell; style filiform, undivided. Capsule usually globular, 3-valved. Seeds 1 or 2 in each cell, not flattened, the upper one erect, the lower pendulous, the funicle expanded into a white or yellowish strophiole; testa black, thickly membranous or almost crustaceous.—Perennials with a tufted or thick often horizontal stock and fibrous roots thickened into tubers in some species. Leaves radical, grass-like. Scapes leafless or nearly so, simple or variously branched. Flowers in terminal or rarely lateral umbels rarely reduced to a single flower. Bracts short scarious imbricate. Pedicels articulate below the middle.

The species are all Australian, but one of them extends to the Philippine Islands and South China. They are often very difficult to discriminate, especially from dried specimens in which the roots and radical leaves supplying some of the most constant characters are often deficient. The difference in proportion between the inner and outer stamens and the absence of the latter in some species may not be always so constant as would appear at first sight.

SERIES 1. **Triandræ.** *Stamens 3. Stock densely tufted, with numerous radical leaves shorter than the scape. Species all Western.*

Scape simple, with a single many-flowered terminal umbel, or very rarely a second sessile one lower down.
  Plant quite glabrous . . . . 1. *T. multiflorus.*
  Leaves hirsute or ciliate . . . . 2. *T. triandrus.*
Scape and leaves slender. Umbels few-flowered, several, often numerous in a dense terminal panicle.
  Roots fibrous, without tubers . . . . 3. *T. glaucus.*
  Roots tuberous . . . . 4. *T. Drummondii.*
Scape slender, low, with a single few-flowered umbel . . 5. *T. pauciflorus.*

SERIES 2. **Hexandræ.** *Stamens 6, 3 usually but not always longer than the others.*

Stock densely tufted, with numerous radical leaves. No tubers. Umbels single.
  Rigid and hirsute. Flowers 9 to 10 lines long, on short pedicels. Western species . . . . 6. *T. asper.*
  Slender and glabrous. Flowers 3 to 4 lines long, on long pedicels. Tropical species . . . . 7. *T. chrysantherus.*
Stock usually tufted, with several radical leaves often rather long. Roots often tuberous. Scape paniculate at the end, with several few-flowered umbels.
  Radical leaves numerous and narrow. Scapes short. Panicles compact, umbels often very few. Western species.
    Stamens all nearly equal . . . . 8. *T. isantherus.*
    Stamens 3 distinctly longer than the others . . . 9. *T. tenellus.*

Radical leaves not very numerous, often long. Umbels usually numerous.

Leaves rather thick. Panicle short, rigid, much-branched. Bracts 2 to 3 lines long. Western species . . . . 10. *T. scaber.*

Leaves very narrow. Panicle loose. Bracts 1 to 2 lines long. Species chiefly Eastern or Southern.

Stamens 3 distinctly longer than the others . . . 11. *T. tuberosus.*

Stamens all nearly equal . . . . 12. *T. exasperatus.*

Leaves very narrow. Panicle thyrsoid, much-branched and compact but slender. Western species . . . . 13. *T. thyrsoideus.*

Stock and leaves unknown. Umbels few-flowered, several sessile along the upper part of a simple or slightly-branched scape, with broad white bracts. Southern species . . . . 14. *T. Baueri.*

Roots tuberous. Leaves few. Stem twining, often much branched and intricate . . . . 15. *T. Patersoni.*

Stock thick, usually horizontal. No tubers. Leaves few, small, and withering early. Umbels mostly terminal, 1- to 3-flowered.

Stems with slender elongated terete branches. Eastern species . . . . 16. *T. junceus.*

Stems rigid, terete, the branches sometimes elongated and rush-like, more frequently flexuose or intricately dichotomous. Western species . . . . 17. *T. dichotomus.*

Flowering stems as in *T. dichotomus*, but others flowerless from the same stock, with a compact panicle of numerous short dichotomous branchlets. Western species . . . . 18. *T. arbuscula.*

Stems rigid, flattened, with the margins acute or winged. Western species . . . . 19. *T. anceps.*

SERIES 1. TRIANDRÆ. Stamens 3 only. Stock in all the species tufted, with numerous radical leaves shorter than the stock.

1. **T. multiflorus,** *R. Br. Prod.* 285.—Stock densely tufted, with fibrous roots, without tubers. Leaves all radical, numerous, densely tufted, erect, rigid, nearly 1 line broad, and much shorter than the scape in the typical form, very narrow and short in some specimens, long flaccid and sometimes exceeding the scape in luxuriant specimens of the var. *prolifer.* Scapes simple, 6 in. to 1 ft. or rarely 1½ ft. high, bearing a single terminal umbel of numerous flowers, or rarely a second one lower down. Pedicels usually longer than the perianth. Perianth-segments about 6 lines long, the outer ones very acute, the inner rather shorter. Stamens 3 only, opposite the inner segments, with short flat filaments; anthers equal, about half as long as the perianth.—Baker in Journ. Linn. Soc. xv. 340; F. Muell. Fragm. vii. 69.

W. Australia. King George's Sound, *R. Brown*, *Baxter*, *F. Mueller;* and thence to Swan River, *Drummond*, 1st *coll.*, *Preiss*, *Oldfield*, and others.

Var. *prolifer.* A luxuriant form, with long narrow leaves and a large many-flowered terminal umbel, with frequently a second one rather lower down.—*T. proliferus*, Lindl. Bot. Reg. 1838, t. 8; Endl. in Pl. Preiss. ii. 38, Maund, Botanist, t. 187.—Swan River, *Drummond*, *Preiss*, *n.* 1572.

T. brevipes, Endl. in Pl. Preiss. ii. 38 from King George's Sound, *Preiss*, *n.* 1573, is founded on what appears to be small starved specimens of *T. multiflorus*, with fewer flowers.

2. **T. triandrus,** *R. Br. Prod.* 284.—Closely resembles the medium or smaller specimens of *T. multiflorus*, and varies equally in stature and in the length and breadth of the leaves, but the leaves and often the base of the scape are more or less hirsute with short rigid pellucid hairs.—Baker in Journ. Linn. Soc. xv. 340; Endl. in Pl. Preiss. ii. 38; F. Muell. Fragm. vii. 69; *Ornithogalum triandrum*, Labill. Pl. Nov. Holl. i. 84, t. 110; *Thysanotus hispidulus*, R. Br. Prod. 285; Baker in Journ. Linn. Soc. xv. 341; *T. nanus*, Endl. in Pl. Preiss. ii. 38.

W. Australia. King George's Sound and adjoining districts, *Labillardière*, *R. Brown*, *Preiss*, *n.* 1571, 1574, *Oldfield*, and others; thence to Swan River, *Drummond*, *1st coll.*, and eastward to Cape Legrand and Esperance Bay, *Maxwell*.

3. **T. glaucus,** *Endl. in Pl. Preiss.* ii. 38.—Stock densely tufted, with fibrous roots not tuberous. Leaves numerous, densely tufted, linear-subulate, nearly terete, much shorter than the scape. Scapes 6 in. to nearly 1 ft. high, erect, slender but rigid, leafless, simple below the inflorescence. Flowers in umbels of 2 or 3, terminating the branches of a terminal dichotomous somewhat corymbose panicle. Pedicels short. Perianth about ½ in. long, the outer segments linear-lanceolate, acute, the inner with a prominent dorsal ridge or wing. Stamens 3, with short flat filaments.—Baker in Journ. Linn. Soc. xv. 341.

W. Australia. Swan River, *Drummond*, *Preiss*, *n.* 1575.

4. **T. Drummondii,** *Baker in Journ. Linn. Soc.* xv. 341.—Stock densely tufted, with fibrous roots, many of them swollen into tubers. Leaves numerous, densely tufted, linear-filiform, 6 to 8 in. long, quite glabrous. Scape very slender, as long as or sometimes exceeding the leaves. Flowers in umbels of 2 to 8, terminating the branches of a close terminal panicle. Pedicels ¼ to ½ in. long. Perianth under ½ in. long. Stamens 3 only.

W. Australia. Swan River, *Drummond*, several specimens in Herb. DC., which I have not seen. The species, according to Mr. Baker, is very near *T. glaucus*, but with fewer leaves, not so rigid, and the roots tuberous.

5. **T. pauciflorus,** *R. Br. Prod.* 285.—A small plant with the aspect of some specimens of *T. isantherus*, and quite glabrous. Leaves tufted, narrow, slender, the longest at least as long as the scape. Scapes 2 to 4 in. high, bearing a single terminal umbel of 1 to 3 flowers, the outer bracts acuminate and one sometimes almost leafy apparently continuing the stem. Perianth 4 to 5 lines long. Anthers 3 only, declinate, about half as long as the perianth.—Baker in Journ. Linn. Soc. xv. 341.

W. Australia. King George's Sound, *R. Brown*.

Series 2. Hexandræ. Stamens 6, 3 of them usually but not always longer than the others, and often produced into a narrow beak.

6. **T. asper,** *Lindl. Swan Riv. App.* 58.—Stock densely tufted, with

the fibrous roots not tuberous, and general habit of *T. triandrus*. Leaves much shorter than the scape, numerous, rather narrow, rigid, erect, hirsute. Scape 1 ft. high or more, erect, rigid, hirsute, bearing a single terminal umbel of 3 to 6 flowers the largest in the genus. Perianth-segments 8 or 9 lines long, the outer ones with very narrow margins. Stamens 6, very unequal, the 3 longer ones ending in long narrow beaks.—Baker in Journ. Linn. Soc. xv. 338.

W. Australia. Swan River, *Drummond, 1st coll.*

7. **T. chrysantherus,** *F. Muell. Fragm.* v. 202.—Stock tufted, with fibrous roots not tuberous. Radical leaves rather numerous, very narrow, shorter than the scape. Scape slender, simple, 6 in. to above 1 ft. long, bearing a single umbel of 3 to 6 flowers. Pedicels filiform, much longer than and sometimes 3 times as long as the perianth. Perianth usually about 4 lines long. Stamens 6, 3 of them longer but not very much longer than the 3 others. Seeds with a white strophiole.—Baker in Journ. Linn. Soc. xv. 337, under *T. chinensis.*

N. Australia. Foot of M'Adam Range, *F. Mueller*; Port Essington, *Armstrong.*

T. chinensis, Benth. Fl. Hongk. 372, from South China and the Philippine Islands, which I had erroneously (as noted by Hance in Ann. Sc. Nat. ser. 5, v. 245) described from a dried specimen as having no fringe to the inner perianth-segments, does not appear to be specifically distinct from *T. chrysantherus.*

8. **T. isantherus,** *R. Br. Prod.* 283.—A small glabrous tufted species, with fibrous roots swollen into tubers distant from the stock. Leaves very fine, rather numerous, often as long as the scape. Scape under 6 in. high, slender, ending in a small almost corymbose panicle. Umbels few, all pedunculate, flowers usually 2 or 3 in the umbel, on pedicels rather shorter than the perianth. Perianth-segments 4 to 5 lines long. Stamens 6, all equal or nearly so, the anthers not at all beaked.

W. Australia. King George's Sound, *R. Brown*; Mount Melville and Upper Kalgan River, *F. Mueller*; Porongerup, *Mrs. Knight.*

The numerous specimens I have now seen of this plant show that it is quite distinct from the tropical *T. chrysantherus*, to which Baker doubtfully refers it.

9. **T. tenellus,** *Endl. in Pl. Preiss.* ii. 37.—Stock tufted, the fibrous roots swollen into tubers usually distant from the stock. Leaves more numerous and finer than in most of the tuberous-rooted species, rather shorter than the scape, with short scarious sheaths. Scape 6 to 9 in. high, simple below the inflorescence, which forms a short rather dense somewhat corymbose panicle. Umbels all pedunculate, usually 3- or 4-flowered, the scarious bracts often numerous. Pedicels rather longer than the perianth when fully out. Perianth-segments 4 to 5 lines long. Stamens 6, 3 of them longer than the 3 others.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 802, *Preiss, n.* 1577.

Baker, in Journ. Linn. Soc. xv. 337, refers this to the *T. tenuis*, Lindl. Bot. Reg. 1838, t. 50, and it may be really only a variety, but the drawing represents longer and stiffer leaves, a very much looser dichotomous inflorescence as long as the undivided part of the stem, and the pedicels all much shorter than the perianth. Unfortunately it does not appear that any specimen was preserved, and the short description was evidently made from the drawing. The identity or distinctness of the two forms cannot therefore be determined until fresh specimens are seen.

10. **T. scaber,** *Endl. in Pl. Preiss.* ii. 37.—Roots fibrous without tubers in most of the specimens, although in one specimen several of them bear tubers. Leaves not very numerous, usually rather shorter than the scape, thick and rather rigid, broader than in *T. tuberosus*, and expanding at the base to 2 lines in breadth. Scape stout, flattened in the upper part, 1 to 1½ ft. high. Panicle short and rigid, the branches usually clustered three together, the ultimate ones bearing each an umbel of several flowers. Bracts 2 to 3 lines long, with a broad base, the inner scarious bracteoles more or less united. Perianth 5 to 6 lines long, on pedicels of 3 to 6 lines, the outer segments with rather broad imbricate margins. Stamens 6, all contracted into a terminal beak, 3 longer than the 3 others, the filaments at least half as long as the anthers.—Baker in Journ. Linn. Soc. xv. 336.

W. Australia. Swan River, *Drummond, Preiss, n.* 1578. Some imperfect specimens from Esperance Bay and Cape Legrand, *Maxwell*, seem almost to connect this species with *T. tuberosus*, although Drummond's specimens appear very different.

11. **T. tuberosus,** *R. Br. Prod.* 282.—Fibrous roots swollen into tubers more or less distant from the stock. Leaves radical, not numerous, narrow-linear, varying from quite short to at least as long as the scape, rarely above 1 line broad and sometimes very fine. Scape erect, rigid, terete, 6 in. to above 1 ft. high, branching into a loose irregularly dichotomous panicle, varying from narrow-pyramidal to almost corymbose, each branch terminating in an umbel of 1 to 3 or 4 flowers, with sometimes a second umbel sessile on the branch rather lower down. Bracts under the branches and pedicels lanceolate, acute, 1-nerved, with scarious margins, and usually 2 short broad scarious bracteoles (often united into one) at the base of each pedicel. Perianths when full-grown 6 to 7 lines long in the larger varieties, scarcely above 4 lines in a few specimens, on pedicels varying from 3 or 4 lines to twice that length. Stamens 6, the 3 opposite the inner segments nearly as long as the perianth, ending in a narrow beak; the 3 others shorter, often much shorter, but the proportions very variable, and sometimes 1 or 2 of the longer ones fully twice the short ones.—Baker in Journ. Linn. Soc. xv. 335; F. Muell. Fragm. vii. 69; Charsley, Wild Pl. Melb. t. 6, f. 1; *T. isantherus*, Lindl. Bot. Reg. t. 655, not of R. Br.

N. Australia. Islands off the north coast (Arnhem's Land), *R. Brown*; Arnhem's Land, *M'Kinlay*; Port Essington, *Armstrong*.

Queensland. Broad Sound, *R. Brown*; from Moreton Bay, *F. Mueller*, and many others, to Rockhampton, *Bowman*, *O'Shanesy*, and others; and Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 499, and many others; northward to Liverpool Plains, *C. Moore;* New England, *C. Stuart;* Hastings, Clarence, and Macleay Rivers, *Beckler* and others; southward to Illawarra, *Shepherd.*

Victoria. Dandenong Ranges and the Grampians to Genoa River, *F. Mueller* and many others.

S. Australia. Flinders Range, *F. Mueller;* Central Australia, *Gosse.*

W. Australia? Some specimens from Tone and Kalgan Rivers, *Oldfield*, are not distinguishable from some eastern forms of *T. tuberosus*, and possibly *T. scaber* may be only an extreme variety.

T. elatior, R. Br. Prod. 283, as generally understood and as probably meant by Brown when indicating Port Jackson as the station, is a tall strong many-flowered form, not uncommon in N. S. Wales and Queensland, but the specimens marked *T. elatior* in Herb. R. Br. are a tall slender form with few umbels from the islands off the N. coast.

T. paniculatus, R. Br. Prod. 283, Baker in Journ. Linn. Soc. xv. 337, and *T. Banksii*, R. Br. Prod. 283, belong to a rather slender form frequent in Queensland, with a rather loose pyramidal panicle.

Var. *parviflora*, from New England and Moreton Bay, only differs in the perianths, scarcely above 4 lines long.

12. **T. exasperatus,** *F. Muell. Fragm.* i. 21.—Closely allied in every respect to the long-leaved forms of *T. tuberosus*, from which it cannot be distinguished except by the stamens, which are all equal in length, or very nearly so, as in *T. isantherus*. How far this character may be constant remains to be proved.—Baker in Journ. Linn. Soc. xv. 335 adduces it as a synonym to *T. tuberosus*.

S. Australia. Flinders Range, *F. Mueller.*

13. **T. thyrsoideus,** *Baker in Journ. Linn. Soc.* xv. 336.—Root-fibres swollen into oblong tubers at a distance from the stock. Leaves usually very few, narrow, flaccid, often as long as the scape. Scape erect, 6 in. to 1 ft. high, terminating in a compact but slender much-branched pyramidal panicle of 3 to 6 in., the branches terminating in umbels of 1 to 3 flowers. Perianths 4 to 5 lines long, on filiform pedicels, the segments narrow. Stamens 6, 3 longer than the others.

W. Australia. Swan River, *Drummond*, 1*st coll.;* Champion Bay, *Oldfield;* Perongerup, *E. Knight.* Though very different in aspect from *T. tuberosus*, this species is not easily distinguished by positive characters.

14. **T. Baueri,** *R. Br. Prod.* 283.—Root-fibres swollen into ovoid or oblong tubers, generally distant from the stock. Leaves not numerous, narrow, usually much shorter than the scape, with rather broad scarious sheaths, but all withering very early, most specimens being quite leafless. Scape from under 6 in. to near 1 ft. high, simple including the inflorescence or slightly branched in the upper part. Umbels mostly 2- or 3-flowered, and usually several sessile along the upper part of the scape and its branches, besides the terminal one, the scarious bracts often rather large. Pedicels rather shorter than the perianth. Perianth-segments varying in size as in other species, but rarely under 4 or above 5 lines long, the opaque centres very dark in the dried specimens. Stamens 6,

unequal, but the 3 longer ones sometimes not much exceeding the others. —F. Muell. Fragm. vii. 69; Baker in Journ. Linn. Soc. xv. 336, but not the northern *T. Banksii* given as a synonym.

N. S. Wales. Between the Darling and Lachlan Rivers, *Burkitt.*
Victoria. Murray River and Wimmera, *F. Mueller.*
S. Australia. Around St. Vincent's Gulf, *F. Mueller.*

T. humilis, F. Muell. Fragm. i. 22, appears to me to be the same species. It is described as having the stamens all equal, but in the flowers I examined three were decidedly longer. In some specimens the lateral umbels were wanting, but in others there were three or four, as in the normal form. No specimen of the species is to be found in Brown's herbarium, but his character leaves no doubt as to its identity.

15. **T. Patersoni,** *R. Br. Prod.* 284.—Roots tuberous, oblong, clustered and close to the stock. Radical leaves few and mostly reduced to a sheathing scarious scale with a short linear subulate blade and withering early, the specimens usually leafless except the small linear scales under the branches. Stems slender, wiry, twining, but generally low, intricately branched in the flowering part. Flowers solitary or very rarely 2 together on the ultimate branches or terminal peduncles, with a pair of small bracts at the articulation 1 to 2 lines below the perianth. Perianth-segments varying from 3 to 5 lines long. Stamens 6, 3 of them longer than the others, but in variable proportions. Capsule globular, 2 to 3 lines diameter.—Baker in Journ. Linn. Soc. xv. 340; Hook. f. Fl. Tasm. ii. 54; F. Muell. Fragm. vii. 69; *T. Menziesii*, R. Br. Prod. 284; *T. Manglesianus*, Kunth, Enum. iv. 616; Endl. in Pl. Preiss. ii. 37.

N. S. Wales. Nangas, *McArthur*; Lake George, *Woolls*; Paterson River, *Vicary.*
Victoria. Wendu Vale, *Robertson*; Portland, *Allitt*; Port Phillip, *Gunn*; Melbourne and Upper Yarra, *F. Mueller* and others.
S. Australia. Yorke Peninsula, *Forder*; St. Vincent's Gulf, *F. Mueller* and others; Rivoli Bay, *F. Mueller.*
Tasmania. Creeping amongst grass, not uncommon in many parts of the island, but easily overlooked, *J. D. Hooker.*
W. Australia. King George's Sound, *Menzies*; apparently common from thence to Swan and Murchison Rivers, *Drummond*, *1st coll.*, *Preiss*, *n.* 1568, *Oldfield*, and many others. The western specimens have usually but not always larger flowers than the eastern ones, but do not otherwise differ. The twining stems are peculiar to this species, except a slight tendency to it in some exceptional forms of *T. dichotomus*, which, however, has never tuberous roots.

16. **T. junceus,** *R. Br. Prod.* 283.—Rhizome thick, horizontal when old, with fibrous roots without tubers. Radical leaves few, narrow-linear, short and soon withering away. Stems slender, loosely branched, erect or flexuose, 1 to 2 ft. high, bearing sometimes a short leaf near the base, and linear scarious scales under the branches. Umbels of 1 to 3 flowers, terminal and sometimes 1 or 2 sessile along the branches lower down. Pedicels 3 to 6 lines long, or even longer when in fruit, the articulation often close to the base. Perianth-segments 5 to 6 lines long.

Stamens 6, 3 of them longer than the others.—Baker in Journ. Linn. Soc. xv. 338; F. Muell. Fragm. vii. 69; Bot. Mag. t. 2351; Bot. Reg. t. 656; *Chlamysporum juncifolium*, Salisb. Parad. Lond. t. 103.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; Hastings River, *Beckler*; Newcastle, *Leichhardt*.

17. **T. dichotomus,** *R. Br. Prod.* 284.—Rhizome thick, horizontal when old, with fibrous roots without tubers. Radical leaves few, short, withering early. Stems exceedingly variable in habit, sometimes erect, loosely branched, and 1 to 2 ft. high, as in *T. junceus*; but usually more rigid, sometimes with long and spreading solitary or clustered branches, or very flexuose and repeatedly forked so as to be as intricate as in *T. Patersoni*, rarely almost twining, when much branched the lower branches without flowers, and all leafless except the very small scarious scales or bracts, terete and more or less striate or angular. Umbels all terminal, reduced to 1 or 2 or rarely 3 flowers, the bracts very small, the pedicels shorter than the perianth. Perianth-segments 5 to 6 lines long, often very deeply coloured in the dry state. Stamens 6, the anthers of the 3 longer ones usually ending in long beaks.—Baker in Journ. Linn. Soc. xv. 339; F. Muell. Fragm. vii. 69; *Ornithogalum dichotomum*, Labill. Pl. Nov. Holl. i. 83, t. 109; *Thysanotus divaricatus*, R. Br. Prod. 284; *T. sparteus*, R. Br. l. c. 283; Endl. in Pl. Preiss. ii. 37; Baker in Journ. Linn. Soc. xv. 338; *T. intricatus*, Endl. in Pl. Preiss. ii. 37; Bot. Reg. 1840, t. 4; *T. anceps*, Endl. l.c. not of Lindl.; *T. Lindleyanus*, Endl. l.c. 36.

Victoria. Glenelg River, *Robertson*, *F. Mueller*.

S. Australia. St. Vincent's Gulf and Kangaroo Island, *F. Mueller*; Port Lincoln, *Wilhelmi*.

W. Australia. King George's Sound, *Labillardière*, *R. Brown*, and many others, and thence to Swan and Murchison Rivers, *Drummond*, *n.* 191, 312, *Oldfield*, *Preiss*, *n.* 1563, 1564, 1565, 1569, and others; eastward to Cape Legrand and Esperance Bay, *Maxwell*.

This species is so variable in habit that, seeing only the extremes, it is difficult to believe that they ought to be considered as varieties only, but with the large herbaria of Kew and of F. Mueller before me, I find so gradual a passage from the erect virgate little-branched habit almost of *T. junceus*, to the very intricate and flexuose dichotomous specimens with the aspect almost of some forms of *T. Patersoni*, that I am unable to draw any definite lines of separation of marked varieties. Labillardière's typical form is not much branched, and the leaves are represented as linear and hispid as well as the base of the stem, but I have seen only a very few specimens quite answering to that character. In most specimens the leaves have quite disappeared, and the whole plant is glabrous. *T. deformis*, R. Br. Prod. 284, has the branches not numerous, very flexuose and almost scandent, with but few umbels. *T. flexuosus*, R. Br. l. c. 284, is a dwarf and very intricately-branched form. *T. elongatus* and *T. gracilis*, R. Br. l. c. 283, appear to me both to be very slender and elongated states of the species, although Baker retains them as distinct under the latter name. Of *T. tenuis*, Lindl. Bot. Reg. 1838, t. 50, we have no specimen; from the figure it may possibly be a reduced form of *T. dichotomus*, of which it has the short pedicels and other characters, but the anthers appear to be different. Baker in Journ. Linn. Soc. xv. 537 regards it as the same as *T. tenellus*, Endl. above, p. 40.

18. **T. arbuscula**, *Baker in Journ. Linn. Soc.* xv. 339.—Rhizome thick, horizontal, almost fleshy, with fibrous roots without tubers. Leaves few, short, and dying off early. Stems rather slender but rigid, erect, about 1 ft. high, simple and flexuose in the lower half, dichotomously paniculate in the upper part; some of the stems quite barren with the branchlets very numerous and short, the flowering stems taller with the branchlets longer and less numerous. Umbels and flowers of *T. dichotomus*, to which species this one also might be referrible, although the contrast of the barren and flowering stems give it a peculiar aspect.

W. Australia. Swan River, *Drummond*, 1st *coll.*

19. **T. anceps**, *Lindl. Swan Riv. App.* 58, *not of Endl.*—Root and leaves unknown. Stems erect, leafless, rigid, branching, 1 to 1½ ft. high, the branches flattened and bordered on each side by an acute edge or narrow wing, giving the whole branch a width of 1 to 2 lines. Umbels 2- or 3-flowered, usually solitary at the ends of the branches. Pedicels short. Perianth about ½ in. long, the outer segments very narrow.—Baker in Journ. Linn. Soc. xv. 339.

W. Australia. Swan River, *Drummond*, 1st *coll.*

24. HODGSONIOLA, F. Muell.

(Hodgsonia, *F. Muell.*, *not of Hook. f.*)

Perianth twisted over the ovary after flowering, but at length deciduous, of 6 segments very shortly connected at the base, all equal or the inner ones rather smaller. Stamens 6, attached to the base of the perianth, 3 opposite the outer segments with very short filaments, and a small lanceolate anther with little or no pollen, 3 opposite the inner segments perfect, with rather longer filaments; anthers linear, entire, as long as the perianth, cohering round the style, the connectives produced beyond the narrow cells into a single tube. Ovary short, 3-celled, with 2 ovules (or sometimes only 1 ?) in each cell; style filiform, with a small capitate terminal stigma. Capsule broad, 3-furrowed, the pericarp rather thick, opening loculicidally in 3 valves. Seeds usually 1 in each cell, not flattened, with a black shining crustaceous testa. Albumen copious, embryo. . . .—Root fibrous. Leaves few, radical, linear-terete. Stem rush-like, simple, ending in a simple raceme. Pedicels filiform, each within a short linear or lanceolate scarious bract.

The genus is limited to the single Australian species.

1. **H. junciformis**, *F. Muell. Fragm.* ii. 176.—Leaves few, radical, slender, and rush-like, 3 to 6 in. long, shortly dilated and sheathing at the base, a few of the outer sheaths without any blade. Stems slender, 1 to 2 ft. high, entirely leafless or with a single scarious scale below the inflorescence. Raceme at first very short, but lengthening out to several inches, with rather numerous flowers. Pedicels scarcely as long as the perianth. Perianth-segments narrow, about 4 lines long. Capsule very

obtuse, rather more than 2 lines broad.—Baker in Journ. Linn. Soc. xv. 289; *Hodgsonia junciformis*, F. Muell. Fragm. ii. 96.

W. Australia. Vasse River, *Oldfield*, *Preiss*, and probably from the same neighbourhood, *Drummond, n.* 205.

25. CÆSIA, R. Br.

Perianth spirally twisted over the ovary after flowering, but at length deciduous, of 6 3-nerved segments, shortly united at the base, all equal in length, but the inner ones with broader thin margins. Stamens 6, attached to the base of the perianth, and (in the Australian species) shorter than the segments; filaments filiform; anthers oblong, shorter than the filaments, recurved, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 2 superposed ovules in each cell; style slightly thickened upwards, undivided. Capsule depressed, obtusely 3-angled or 3-lobed, opening at length in 3 valves. Seeds usually solitary in each cell, globular, the short funiculus expanded into a small broad strophiole; testa black, crustaceous, tubercular-granulate.—Tufted herbs with fibrous roots more or less thickened into oblong tubers. Leaves grass-like, crowded at the base of the stem. Stems simple or branched. Flowers blue or rarely white, in clusters or sessile umbels along the upper portion of the stem or branches, forming terminal racemes. Bracts very short and scarious.

Besides the Australian species, which are all endemic and possibly varieties of a single one, there are several African ones.

Perianth-segments 3 to 4 lines long. Leaves often rather broad, not surrounded by filaments	1. *C. vittata.*
Perianth-segments under 3 lines long. Leaves rather broad or narrow, not surrounded by filaments.	
Leaves flaccid with fine nerves	2. *C. parviflora.*
Leaves rigid, with 3 to 5 very prominent nerves on each side	3. *C. rigidifolia.*
Perianth-segments under 3 lines long. Leaves very narrow, surrounded at the base by long filaments, the remains of old sheaths	4. *C. setifera.*

1. **C. vittata,** *R. Br. Prod.* 277.—Fibres more or less thickened into long tubers. Leaves crowded at the base of the stem, with more or less scarious sheaths and grass-like blades, very variable in length and breadth, but mostly shorter than the stem, a few much smaller at the base of the branches. Stem erect, simple, or with a few long branches, usually about 1 ft. high, but sometimes not half that length, and sometimes much longer, the inflorescence occupying more than the upper half. Umbels or clusters of 2 to 4 or rarely more flowers, sessile along the rhachis, surrounded by very short scarious bracts, the filiform pedicels within the umbel varying from 2 to 4 lines. Perianth-segments usually blue, 3 to 4 lines long. Capsule about 2 lines broad, depressed at the top, and more prominently lobed than in *Anthericum;* but when ripe opening at the top in 3 valves, as in that genus.—Baker in Journ.

Linn. Soc. xv. 358; Hook. f. Fl. Tasm. ii. 53; F. Muell. Fragm. vii. 68.

Queensland. Herbert Creek, *Bowman;* Warwick, *Beckler.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls*, and others; northward to New England, *C. Stuart;* Hastings River, *Beckler;* Richmond River, *Fawcett;* southward to Illawarra, *A. Cunningham.*
Victoria. Wendu Vale, *Robertson;* from Port Phillip and the Yarra to Wimmera, *F. Mueller* and others.
Tasmania. Port Dalrymple, *R. Brown;* common in grassy places, especially in the northern parts of the island, *Gunn* and others.
S. Australia. St. Vincent's Gulf, *F Mueller* and others; Encounter Bay, *Whittaker;* Yorke Peninsula, *Fowler.*

Var. *chlorantha.* Perianth-segments white with a greenish centre. *C. chlorantha*, F. Muell. Fragm. i. 63; Baker in Journ. Linn. Soc. xv. 359.

N. Australia. Sturt's Creek, *F. Mueller.*
Queensland. Peak Downs, *F. Mueller.*

2. **C. parviflora,** *R. Br. Prod.* 277.—Closely allied in every respect to *C. vittata*, and scarcely more slender or with narrower leaves, but both the flowers and fruits much smaller, the perianth-segments under 3 lines long.—Baker in Journ. Linn. Soc. xv. 358; Hook. f. Fl. Tasm. ii. 53; F. Muell. Fragm. vii. 67; *C. occidentalis*, R. Br. Prod. 277; Endl. in. Pl. Preiss. ii. 33; Baker in Journ. Linn. Soc. xv. 358; *C. micrantha*, Lindl. Swan Riv. App. 57; Endl. l. c. 34.

Queensland. Moreton Bay, *Herb. F. Mueller;* Burnet River, *Daly;* Rockhampton? *Bowman.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; northward to New England, *C. Stuart;* Clarence River, *Wilcox;* Richmond River, *Fawcett.*
Victoria. Yarra and Port Phillip, *F. Mueller.*
Tasmania. Port Dalrymple, *R. Brown;* northern coasts of the colony at Georgetown, Launceston, etc., *Gunn* and others.
W. Australia. King George's Sound, *R. Brown* and many others; and thence to Vasse and Swan Rivers, *Drummond*, *n.* 335, *Oldfield*, *Preiss*, *n.* 1546, 1547, 1548, and others. Apparently common and not distinguishable from the small-flowered eastern plant, and perhaps the only species in West Australia, although one specimen from Champion Bay, *Miss Guerin*, has the flowers almost as large as in the common *C. vittata.*

3. **C. rigidifolia,** *F. Muell. Fragm.* x. 48.—Very nearly allied to *C. parviflora*, but at once known by the lower leaves 9 in. to 1 ft. long, very rigid, 1 to 1½ lines broad, tapering to a sharp point, with 3 to 5 very prominent obtuse longitudinal nerves or ribs on each side. Panicle and flowers apparently the same as in *C. parviflora*, but the flowers in bud only, and in that state scarcely 2 lines long.

S. Australia. Victoria Springs, Central Australia, *Young*, a single specimen in Herb. F. Mueller. F. Mueller describes the perianth-segments as spirally twisted after flowering, and not articulate on the pedicel, which however is not shown on the specimen, which is only in young bud.

4. **C. setifera,** *Baker in Journ. Linn.* Soc. xv. 359.—Fibres thickened

into spindle-shaped tubers. Tufts of leaves surrounded by long filaments, the remains of old leaf-sheaths. Leaves very narrow and shorter than in *C. parviflora.* Stems simple or branched, slender, attaining 1 ft. or more. Flowers and all other characters precisely those of *C. parviflora.*

N. Australia. Port Darwin, *Schultz, n.* 638.

26. CHAMÆSCILLA, F. Muell.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 oblong spreading 3-nerved nearly equal segments. Stamens 6, hypogynous, shorter than the segments; filaments filiform; anthers small, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several (rather numerous) ovules in each cell; style filiform, with a terminal capitate stigma. Capsule laterally 3-lobed, the lobes laterally compressed, with an acute dorsal edge. Seeds few in each cell, flattened with acute margins, laterally attached; testa black, crustaceous, smooth and shining. Glabrous perennials, with fibrous roots often thickened into tubers. Leaves radical, grass-like. Scapes leafless, bearing a dichotomous corymb or thyrsoid panicle of blue flowers. Pedicels solitary within scarious bracts.

The genus is limited to Australia, showing the perianth of *Cæsia*, with the fruit and seeds of *Chlorophyton.*

Inflorescence loosely corymbose. Perianth about 4 lines long 1. *C. corymbosa.*
Inflorescence compact, almost thyrsoid. Perianth about 5 lines long . . . . 2. *C. spiralis.*

1. **C. corymbosa,** *F. Muell. Fragm.* vii. 68.—Fibres of the roots more or less thickened into tubers. Leaves often densely tufted, but not usually surrounded by the filamentous remains of old sheaths; linear and grass-like, often small and narrow, but sometimes above 6 in. long and 6 to 8 lines broad, mostly contracted into a petiole; which is again shortly dilated at the base into a scarious sheath. Scapes varying from about 2 in. with only 1 or 2 flowers, to above 6 in. and bearing a loose dichotomous corymb of numerous blue flowers. Pedicels 2 to 6 lines long. Perianth-segments oblong, about 4 lines long. Capsule obovoid, truncate at the top, 3 to 5 lines long, the 3 laterally compressed angles or lobes very prominent.—*Cæsia corymbosa*, R. Br. Prod. 277; Hook. f. Fl. Tasm. ii. 52, t. 132; Baker in Journ. Linn. Soc. xv. 360; *C. versicolor*, Lindl. Swan Riv. App. 57; Endl. in Pl. Preiss. ii. 34.

Victoria. Wendu Vale, *Robertson*; Port Phillip, *Gunn*; and thence to the Grampians and Wimmera, *F. Mueller, Dallachy*, and others.
Tasmania. Abundant in grassy places throughout the island, *J. D. Hooker.*
S. Australia. Round St. Vincent's and Spencer's Gulfs, *F. Mueller* and others.
W. Australia. King George's Sound, *Menzies*; and thence to Swan River, *Drummond, 1st coll. and n.* 804, *Oldfield, Preiss, n.* 1545, and others.

2. **C. spiralis,** *F. Muell. Fragm.* vii. 68.—Very near the *C. corymbosa*, and perhaps a variety only. Radical leaves not numerous, often

surrounded by long filaments the remains of old leaf-sheaths, linear or almost linear-spathulate, 1 to 2 in. long in our specimens, contracted into a petiole, with scarious sheathing bases at least 1 in. long. Scapes under 1 ft. high, straight or flexuose, terminating in a small panicle much more compact and thyrsoid than in *C. corymbosa*, the lower branches bearing 2 or 3 flowers, the uppermost only single ones. Pedicels filiform. Perianth-segments about 5 lines long. Anthers shortly oblong, recurved after shedding the pollen. Ovules rather numerous in each cell. Capsule not seen ripe, but apparently smaller than in *C. corymbosa*, with seeds similarly flattened.—*Cæsia spiralis*, Endl. in Pl. Preiss. ii. 34; Baker in Journ. Linn. Soc. xv. 359.

W. Australia. *Drummond*, *n.* 805; Princess Royal Harbour, *Preiss*, *n.* 1513 Stirling Range, *F. Mueller*; Bremer Bay, *Maxwell.*

Cæsia paradoxa, Endl. in Pl. Preiss. ii. 34; Baker in Journ. Linn. Soc. xv. 361, may be a starved specimen of the same species, and at any rate is not otherwise determinable.

27. CORYNOTHECA, F. Muell.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 spreading segments, all nearly equal in length, the inner ones rather broader. Stamens 6, attached to the base of the perianth and shorter than the segments, the 3 opposite the inner segments longer than the 3 others; filaments filiform, glabrous; anthers ovate or oblong, usually shorter than the filaments, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 or sometimes only 1 ovule in each cell, and all except 1 constantly abortive; style filiform, with a terminal stigma. Fruit a single ovoid indehiscent 1-seeded nutlet. Seed obovoid, erect or pendulous, the funicle shortly expanded into a black strophiole; testa black, crustaceous, minutely granulated but often shining.—Slender rigid much-branched herbs, leafless except a few radical narrow leaves early withering away, and scarious scales under the branches. Flowers minute, solitary or rarely 2 together within minute bracts along the smaller branches.

The genus is limited to Australia.

Branches elongated, divaricate, dichotomous, or clustered 2 or 3 together	1. *C. lateriflora.*
Branches filiform, flexuose, or very intricately dichotomous	2. *C. dichotoma.*
Stems erect, with numerous short slender acerose often forked pungent branches	3. *C. acanthoclada.*

1. **C. lateriflora,** *F. Muell. Fragm.* vii. 68.—Stems rigid but not thick, with numerous branches, dichotomous or clustered 2 or 3 together, elongated and divaricate. Leaves very rarely seen at the base of the stem, very narrow almost subulate, and only two or three in. long, those of the stem reduced to scarious scales under the branches, or the lower ones sometimes produced into a subulate point of ½ to 1 in. Flowers whitish, solitary or rarely 2 together along the branches, on very short pedicels within a minute scarious bract. Perianth 1½ to nearly 2 lines

long. Anthers oblong but usually shorter than the filament. Fruit an obovoid nutlet, little more than 1 line long, the abortive cells forming a protuberance along one side.—*Cæsia lateriflora*, R. Br. Prod. 277; Baker in Journ. Linn. Soc. xv. 360.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* shores of the gulf, *F. Mueller;* Curlew River, N.W. coast, *A. Cunningham.*
N. S. Wales. In the interior, *Mitchell;* sand ridges on the Murray, near Mount Dispersion, *F. Mueller.*
W. Australia. Sandy shores of Murchison River, *Oldfield.*

2. **C. dichotoma,** *F. Muell. Fragm.* vii. 68.—Stems rigid, filiform or rather stout, very much branched, the flexuose or dichotomous branches often very intricate. Leaves not seen, the scales under the branches very minute or none. Flowers distant along the straighter filiform branchlets or more frequently at the outer angle of the zigzag flexuose branches. Perianth rather above 1 line long, on a shorter pedicel. Nutlet clavate as in *C. acanthoclada*, but contracted at the base into a rather longer stipes.—*Cæsia dichotoma*, F. Muell. Fragm. i. 215; Baker in Journ. Linn. Soc. xv. 360; *Asparagus micranthus*, Lindl. Swan. Riv. App. 58; *Thysanotus micranthus*, Endl. in Pl. Preiss. ii. 36; *Anthericum flexuosum*, R. Br. Herb.

W. Australia. Doubtful Island Bay, *R. Brown;* Swan River, *Drummond*, 1*st coll.*, *Preiss, n.* 1566 and 1576, and others; Blackwood River, *Forrest* and others; Murchison River, *Oldfield.*

3. **C. acanthoclada,** *F. Muell. Fragm.* vi. 68.—Stems slender but rigid, forming dense erect tufts of 6 in. to 1 ft., with numerous short acerose pungent branches, most of them again forked or slightly branched, but rarely above 1 in. long. Radical leaves few and early withering, leaving only the remains of their scarious sheaths on our specimens, those on the stem all reduced to small scarious scales. Flowers few, scattered along the lateral branchlets, reflexed, on very short pedicels, solitary or rarely 2 together within a minute bract. Perianth scarcely 1 line long. Anthers ovate, much shorter than in *C. lateriflora*. Nutlet clavate, about 1 line long. Seed rather more distinctly granulate than in *C. lateriflora*.—*Cæsia acanthoclada*, F. Muell. Fragm. i. 215; Baker in Journ. Linn. Soc. xv. 360.

W. Australia. Limestone Hills, Murchison River, *Oldfield.*

28. TRICORYNE, R. Br.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 narrow 3- or 5-nerved segments, all entire and equal or the inner ones rather narrower. Stamens 6, hypogynous, shorter than the perianth; filaments filiform, with a dense woolly tuft under the anther; anthers narrow-oblong, erect, emarginate at the base, the cells opening inwards in longitudinal slits. Ovary sessile, deeply 3-lobed and

3-celled, with 2 erect ovules in each cell or lobe; style filiform, undivided. Fruit divided to the base into 3 (reduced sometimes by abortion to 2 or 1) 1-seeded indehiscent nutlets, dry or slightly fleshy, strongly reticulate or ribbed. Seed black with a crustaceous testa and fleshy albumen.—Perennials with fibrous roots. Stems usually wiry and branching, the branches often clustered. Leaves few and grass-like, or all reduced to scarious scales; more rarely small and more leafy plants. Flowers in terminal umbels with small imbricate scarious bracts, of which one or two outer empty ones often elongated or leaf-like.

The genus is limited to Australia.

Stems wiry or rush-like, branched and without leaves, except a few at the base, usually 1 to 2 ft. high. Flowers 6, or fewer in the umbel or rarely more.	
Stems bordered by narrow wings	1. *T. platyptera.*
Stems usually with clustered branches, deeply striate, acutely angled, or slightly flattened.	
Quite glabrous	2. *T. anceps.*
Stem and branches hispid	3. *T. muricata.*
Stems less branched, terete, or slightly striate . .	4. *T. elatior.*
Stems simple, under 1 ft., with a single many-flowered umbel, and rather long radical leaves. Eastern species .	5. *T. simplex.*
Stems under 6 in., branched and leafy, with several many-flowered umbels. Western species	6. *T. humilis.*

1. **T. platyptera,** *Reichb. f. Beitr. Syst. Pflanzenk.* 72.—Very near *T. anceps* and more deserving of that name, but as far as the specimens show apparently distinct. Stems from a shortly creeping base erect or ascending, sparingly branched, 1 to nearly 2 ft. high, the branches flattened with the margins more or less winged, the total breadth varying from 1 to 3 lines. Leaves very few at the base of the stem and rarely 1 in. long, those under the branches rigid, erect, under ½ in. or all reduced to very small scales. Umbels of several, often more than 6, flowers. Perianth-segments 4 to 5 lines long, the pedicels nearly as long. Bracts under the pedicels all very small. Nutlets obliquely ovoid, nearly two lines long, strongly ribbed when dry, contracted at the base into a short thick stipes.—*T. pterocaulon*, Baker in Journ. Linn. Soc. xv. 363.

Queensland. Sandy shores, Cape York, *Veitch, Daemel;* Fitzroy Island, *Walter;* Dunk Island, *M'Gillivray;* Cleveland Bay, *Bowman;* Port Denison, *Hecate Expedition;* gathered also in *Hann's Expedition*, and by Frau Dietrich. I have not seen her specimens, but Reichenbach's character is quite sufficient to identify the species.

2. **T. anceps,** *R. Br. Prod.* 278.—Stems erect, slender but rigid and very much branched, the branches often densely clustered, the principal ones prominently striate, but terete or slightly compressed, the numerous smaller ones flattened or acutely 3- or 4-angled but not distinctly winged. Leaves in all the specimens seen reduced to small scales. Umbels of 3 to 6 flowers, with very small bracts. Perianth-segments about 4 lines long, the pedicels shorter. Nutlets as large as in *T. pterocaulon* but smooth.—Baker in Journ. Linn. Soc. xv. 363.

Queensland. Sandy shores, Endeavour River, *Banks and Solander*, *A. Cunningham*; Rockingham Bay, *Dallachy*.

3. **T. muricata,** *Baker in Journ. Linn. Soc.* xv. 363.—Stems erect, rigid, with numerous slender strongly striate or angular branches as in *T. anceps*, but the angles hispid with small rigid transparent hairs. Leaves reduced to scales, umbels and flowers of *T. anceps*, of which this may prove to be a hispid variety.

Queensland. Wide Bay, *Bidwell*.

4. **T. elatior,** *R. Br. Prod.* 278.—Stems from a perennial sometimes thick and woody rhizome erect or ascending, more or less branched, often under 1 ft. but sometimes above 2 feet high, the branches few or numerous, but rarely more than 3 in a cluster, slender or even filiform especially in the western specimens, striate but less so than in *T. anceps*. Lower leaves often grass-like, 2 to 4 in. long, the upper ones and sometimes all reduced to short scales. Umbels usually 3- or 4-flowered in the eastern specimens, with 6 or more flowers in most of the western ones, the scarious bracts usually prominent and 1 or 2 outer ones often produced into subulate points of 3 or 4 lines. Perianth very variable in size, but usually about 4 lines long. Nutlets smaller than in *T. anceps*.—Baker in Journ. Linn. Soc. xv. 362; Bauer, Illustr. Pl. Nov. Holl. t. 11; Endl. Iconogr. t. 61; Endl. in Pl. Preiss. ii. 35; Hook. f. Fl. Tasm. ii. 55; *T. anceps*, Endl. l.c. 36, not of R. Br.

Queensland. Moreton Island, *M'Gillivray*, *Eaves*; Condamine River, *Leichhardt*; Peak Downs, *F. Mueller*; Armidale, *Perrott*; Rockhampton, *O'Shanesy*; Port Curtis, *M'Gillivray*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart*; Hastings River, *Beckler*; southward to Illawarra, *A. Cunningham*; and in the interior, Darling River to Cooper's Creek, *Victorian and other Expeditions*.

Victoria. Common on the Glenelg, the Yarra, etc., and in the Grampians, *Robertson*, *F. Mueller*, and others.

Tasmania. South Esk River, *Gunn* and others; Cheshunt, *Archer*. In these Tasmanian specimens the flowers are usually more numerous in the umbels than in those from N. S. Wales, less so than in the western specimens.

S. Australia. St. Vincent's Gulf, *F. Mueller* and others; Port Lincoln, *R. Brown*, *Wilhelmi*.

W. Australia. King George's Sound, *R. Brown*, *A. Cunningham*, *F. Mueller*, and others; and thence to Swan and Murchison Rivers, *Drummond*, *Preiss*, *n.* 1715 and 2227, *Oldfield* and others; eastward to Cape Arid, *Maxwell*.

T. scabra, R. Br. Prod. 278, from Keppel Bay, appears to be a common form of *T. elatior*, but with a few minute hairs scattered on the lower part of the stem, very different from the hispid *T. muricata*.

T. tenella, R. Br. l. c., Baker in Journ. Linn. Soc. xv. 362, from Port Lincoln, is a very slender dwarf branching form, which I cannot otherwise distinguish from *T. elatior*.

5. **T. simplex,** *R. Br. Prod.* 278.—Stems simple or very rarely once-branched, 6 in. to 1 ft. high, with a few grass-like leaves sometimes as long as the stem. Umbel solitary, terminal, with very numerous flowers (usually above 20), the pedicels longer than the perianth. Bracts all

scarious or rarely 1 or 2 outer ones with fine points. Perianth-segments about 5 lines long.—Baker in Journ. Linn. Soc. xv. 362.

Queensland. Moreton Bay, *Herb. F. Mueller* (collector not named).
N. S. Wales. Port Jackson, *R. Brown*, *Vicary*, *J. D. Hooker*, *United States Exploring Expedition.*

6. **T. humilis,** *Endl. in Pl. Preiss.* ii. 36.—Stems under 6 in. high, shortly branched and very leafy above the base, the grass-like leaves rather broad, and many of them exceeding the flowers. Umbels terminating axillary branches shorter than the leaves, and all many-flowered; 2 or 3 of the outer bracts leaf-like and as long as or longer than the flowers. Perianth-segments about 5 lines long, the filiform pedicels longer.—Baker in Journ. Linn. Soc. xv. 362.

W. Australia. Hay District, *Preiss, n.* 1605; sands of Vasse River, *Oldfield*; Lake Muir, *Muir.*

29. STYPANDRA, R. Br.

Perianth withering after flowering but not twisted, and at length deciduous, of 6 spreading segments usually 5-nerved, all equal and entire or the inner ones broader. Stamens 6, hypogynous, much shorter than the perianth; filaments either filiform and flexuose at the base with a dense woolly tuft under the anther, or shortly tomentose-woolly from the base; anthers oblong, very much rolled back after shedding the pollen. Ovary sessile, 3-celled, with several ovules in each cell; style filiform, undivided. Capsule ovoid or oblong, 3-valved. Seeds several (3 to 6) in each cell, ovate, more or less flattened, with a black smooth crustaceous testa, opaque or shining.—Perennials with fibrous roots. Stems erect or ascending, simple below the inflorescence or branched and sometimes woody at the base. Leaves either all radical or distichously spreading on the stem. Flowers blue, in a very loose terminal dichotomous cyme. Pedicels filiform, often 2 or 3 together and terminal or solitary along the branches. Bracts minute or none, or the lower ones leaf-like in the leafy species.

The genus is limited to Australia.

Stems leafy to the inflorescence, often branched at the base and sometimes woody . . . . 1. *S. glauca.*
Stems leafless except at the base. Leaves linear, in dense radical tufts.
Leaves very rigid, $1\frac{1}{2}$ to 3 lines broad. Flowers blue or yellowish, very rarely white . . . . 2. *S. cæspitosa.*
Leaves slender, 1 to $1\frac{1}{2}$ lines, or rarely broader. Flowers usually white . . . . 3. *S. umbellata.*

1. **S. glauca,** *R. Br. Prod.* 279.—A leafy perennial with stems on a creeping rhizome sometimes low and tufted, or weak and ascending, under 1 ft. high, sometimes 2 or 3 ft. high, woody and branched at the base. Leaves distichous, the sheaths usually concealing the stem, somewhat flattened with an acute keel, or almost terete, the blade erect or

spreading, linear or lanceolate, usually 3 to 4 in. long, but sometimes twice that length and varying from 2 to 4 lines in breadth. Flowers in a loose terminal dichotomous cyme usually leafy at the base, the branches very spreading, the filiform pedicels recurved, varying from ½ to 1 in. long, mostly solitary but sometimes 2 together at the ends of the branches, without subtending bracts except sometimes a leafy one under the lowest. Perianth blue, often turning red in drying, the segments very acute, 5-nerved, about 6 lines long. Stamens very much shorter; filaments filiform and twisted in the lower half, with a dense oblong tow-like tuft of hairs under the anther; anther shorter than the filament, much recurved, almost spiral after shedding the pollen. Capsule oblong, 3 to 4 lines long. Seeds several in each cell, rather less flattened than in *S. cæspitosa*, smooth but not shining.—Baker in Journ. Linn. Soc. xv. 356; F. Muell. Fragm. vii. 64; *S. propinqua*, A. Cunn. in Bot. Mag. t. 3417; *S. frutescens*, Knowl. and Westc. Fl. Cab. ii. 61, 69, t. 63; *S. virgata*, Endl. in Pl. Preiss. ii. 35.

Queensland. Darling Downs, *Law.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 202, and others; in the interior to Lachlan River, *A. Cunningham;* Liverpool Plains, *C. Moore;* New England, *C. Stuart.*

Victoria. From the Grampians, *Wilhelmi*, *F. Mueller*, and others; to Eastern Gipps' Land, *Walter.*

W. Australia. King George's Sound, *R. Brown* and others; to Swan and Murchison Rivers, *Drummond*, *Oldfield*, *Preiss*, *n.* 1549, and others.

S. grandiflora, Lindl. Swan Riv. App. 57, from Swan River, *Drummond*, 1*st coll. and n.* 781, is a luxuriant variety, with the perianth 8 or 9 lines long.

S. scoparia, Endl. in Pl. Preiss. ii. 35, from W. Australia, Preiss, n. 1550, found also on Mount Sturgeon in Victoria, *Robertson*, is a variety or perhaps only an old state with very numerous short lateral branches and densely tufted narrow leaves.

S. imbricata, R. Br. Prod. 279, from King George's Sound and Lucky Bay, *R. Brown* and others; and eastward to Cape Legrand, *Maxwell*, is a variety with narrow crowded leaves, which however passes gradually into the common form.

2. **S. cæspitosa,** *R. Br. Prod.* 279.—Stems from a thick horizontal rhizome erect, 1 to 2 feet high, simple below the inflorescence. Leaves mostly radical, with very short distichous sheaths, erect, rigid, 6 in. to 1 ft. long and 1½ to 3 lines broad. Scapes leafless or occasionally with 1 or 2 short leaves with long sheaths. Inflorescence loosely dichotomous and occupying at least half the total height of the plant. Pedicels erect, filiform but rigid, 1 to 2 in. long, usually 3 or 4 together in an umbel at the end of each branch. Bracts linear-lanceolate and almost leafy under the principal branches, very small under the smaller branches and pedicels. Perianth erect, blue or yellowish inside or very rarely white, the segments 5 to 6 lines long, narrower and less acute than in *S. glauca.* Stamens about half as long as the segments, the filaments densely covered with very short cottony hairs almost from the base. Capsule oblong, about 3 lines long. Seeds several in each cell, rather flat, smooth and shining.—Baker in Journ. Linn. Soc. xv. 355; Hook. f. Fl. Tasm. ii. 55; F. Muell. Fragm. vii. 65.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 201, *A. Cunningham*, and others; northward to New England, *C. Stuart*; Newcastle, *Leichhardt*; Mount Mitchell, *Beckler*; in the S.W. interior, *Fraser*, *M'Arthur*.

Victoria. From Dandenong and the Upper Yarra to Gipps' Land, *F. Mueller* and others.

Tasmania. Near Georgetown, abundant, *Gunn*.

3. **S. umbellata,** *R. Br. Prod.* 279.—Very near *S. cæspitosa*, and considered by F. Mueller (Fragm. vii. 65) as a variety only, smaller in every respect and very densely tufted. Radical leaves numerous, mostly 5 to 8 in. long and only 1 to 2 lines broad, not so rigid as in *S. cæspitosa*. Stems including the inflorescence 8 to 10 in. high, the inflorescence much less branched than in that species, and often reduced to a single umbel of 2 to 4 flowers on a simple scape. Perianth-segments about 5 lines long, white or yellowish. Capsule and seeds of *S. cæspitosa*.—Baker in Journ. Linn. Soc. xv. 356; Hook. f. Fl. Tasm. ii. 55.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 200, and others.

Victoria. Wendu Vale, *Robertson*; Mount William, *Wilhelmi*; Latrobe River, *F. Mueller*.

Tasmania. Abundant in sandy soil throughout the island, *J. D. Hooker*.

Var. *Fraseri*, Baker. Leaves and scapes filiform. Flowers few, the perianth-segments narrow and only 3 to 4 lines long. Flowers pure white.

N. S. Wales. Peat swamps near Sydney, rare, *Fraser*, also gathered probably in the interior by *Mitchell*.

30. ARTHROPODIUM, R. Br.

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones broader, and often crisped or shortly fringed on the edges. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments shortly filiform, with a dense tuft of woolly hairs or a papillose appendage in their upper part or occupying nearly the whole filament; anthers linear, erect, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell; style filiform, with a terminal stigma. Capsule 3-valved. Seeds usually few, black, angular, the testa smooth or minutely granular, not shining.—Tufted perennials, with the fibres often thickened into tubers. Leaves radical or crowded at the base of the stem, linear and grass-like, with scarious sheathing bases. Stems simple or with few elongated branches, leafless or with only 1 or 2 short distant leaves below the inflorescence. Flowers loosely racemose, the filiform pedicels solitary or few together within a scariose bract, and when several accompanied by very small bracteoles within the bract.

Besides the Australian species, which are all endemic, there are two from New Zealand, and one New Caledonian species.

Anthers shorter than the filaments, recurved after shedding the pollen; filaments with woolly-hairy appendages. Eastern species.
  Flowers usually 2 or 3 to each bract. Filaments woolly-hairy only above the middle . . . . 1. *A. paniculatum.*
  Flowers usually solitary, small. Filaments shortly woolly-hairy from near the base . . . . 2. *A. minus.*
Anthers as long as or longer than the filaments, not recurved; filaments with papillose or very shortly hairy appendages. Western species.
  Inflorescence divaricately branched. Perianth 3 to 4 lines long . . . . 3. *A. capillipes.*
  Inflorescence simple or with few long branches. Perianth about 5 lines long.
    Leaves grass-like, 1½ to 2 lines broad. Western species . . . . 4. *A. Preissii.*
    Leaves subulate, or if flat ½ line broad. Eastern species. . . . . 5. *A. dianellaceum.*

1. **A. paniculatum,** *R. Br. Prod.* 276.—Fibrous roots thickened into tubers, but only at a distance from the stock. Stems erect, 1 to 2 feet high, usually divided above the middle into a few long slender spreading flowering branches. Leaves narrow, crowded at the base of the stems, from 2 or 3 in. to nearly 1 foot long, with broad scarious sheathing bases, and occasionally a smaller leaf on the stem below the inflorescence. Flowers white or purplish, 2 to 4 together along the branches on filiform pedicels from 2 or 3 lines to above 1 inch long, in the axils of minute bracts. Perianth-segments 3 or rarely 4 lines long, the inner ones much broader than the outer, and often but not always denticulate or almost fringed on the margin. Filaments with a dense tuft of woolly hairs only above their middle.—Baker in Journ. Linn. Soc. xv. 352; Hook. f. Fl. Tasm. ii. 50; F. Muell. Fragm. vii. 66; *Anthericum paniculatum*, Andr. Bot. Rep. t. 395; *Phalangium paniculatum*, Poir. Dict. Suppl. iv. 383; *Anthericum milleflorum*, Red. Lil. t. 58; *Phalangium pendulum*, Red. Lil. t. 360 (?), Bot. Mag. t. 1421, Endl. Iconogr. t. 28; *Anthericum pendulum*, Hornem.; Willd. Enum. Hort. Berol. 371; *Arthropodium pendulum*, DC.; Kunth, Enum. iv. 620, Baker in Journ. Linn. Soc. xv. 353; *A. minus*, Lindl. Bot. Reg. t. 866; *A. Lindleyi*, Kunth, l. c. 621.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; New England, *C. Stuart*.

Victoria. From the Upper Yarra to Gipps' Land, *F. Mueller*, *Walter*, and others.

Tasmania. Port Dalrymple, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. Mount Gambier, *F. Mueller* and others.

Redouté's figure of his *Phalangium pendulum* differs from all the specimens I have seen, including those since cultivated in the Paris garden under his name, in having the inner segments not broader than the outer ones. What is generally considered as his plant only differs from the typical *A. paniculatum* in the shorter pedicels.

2. **A. minus,** *R. Br. Prod.* 276.—Roots a fascicle of oblong tubers close to the stock. Stems slender, from under 6 in. to 1 ft. or rather

more, simple or rarely with one branch. Leaves radical, much shorter than the stem, varying from 1 to 3 lines broad. Flowers solitary within each bract or very rarely 2 together, usually smaller than in *A. paniculatum*, the perianth-segments 2½ to 3 lines long. Filaments longer than the anther, the woolly hairs extending over the greater part of their length.—Baker in Journ. Linn. Soc. xv. 353; Hook. f. Fl. Tasm. ii. 51.

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart*; Nangas, *M'Arthur.*

Victoria. From the Glenelg and Port Phillip to the Grampians, *Robertson*, *F. Mueller*, and many others; Wimmera, *Dallachy.*

Tasmania. Rich pasture land in the northern parts of the island, *Gunn.*

3. **A. capillipes,** *Endl. in Pl. Preiss.* ii. 34.—Roots apparently all fibrous and not thickened into tubers. Radical leaves narrow but mostly withered away from the flowering specimens. Stems 1 to 2 ft. high, divaricately branched, with occasionally a filiform leaf under the lowest branches. Pedicels solitary within each bract, filiform, divaricate, 1 in. long or more. Perianth-segments 3 to 4 lines long. Filaments with tufts of dense papillæ or very short hairs extending some way down from the anther and ending in 2 short lobes, thus connecting this species with the genus *Dichopogon.*

W. Australia. Swan River, *Preiss*, *n.* 1555, and apparently also an imperfect specimen, *Drummond*; Port Gregory, *Oldfield*; south coast, *Maxwell*, *Miss Sewell*. Baker in Journ. Linn. Soc. xv. 353, refers this to the eastern *A. paniculatum*, from which it appears to me to differ in the roots, inflorescence, and stamens.

4. **A. Preissii,** *Endl. in Pl. Preiss.* ii. 35.—Roots apparently fibrous without tubers. Radical leaves densely tufted, grass-like, mostly 1½ to 2 lines broad, surrounded by numerous filaments the residue of old leaf-sheaths. Stems 1 to 2 ft. high, with a few long branches or sometimes quite simple. Pedicels solitary or 2 or 3 together within each bract, ½ to 1 in. long, usually reflexed, the bracts very small. Perianth-segments narrow, about 5 lines long. Filaments thickened and papillose in the upper half but scarcely hairy; anthers linear, as long as or longer than the filament. Capsule recurved.—Baker in Journ. Linn. Soc. xv. 353.

W. Australia. Swan River, *Preiss*, *n.* 1567, *Drummond*, *n.* 806; Port Gregory, *Oldfield*; Blackwood River, *Forrest*; Salt River, *Maxwell.*

5. **A. dianellaceum,** *F. Muell. Fragm.* x. 65.—Fibrous roots more or less thickened into tubers. Radical leaves few, subulate or when flat not above ½ line broad, very shortly dilated into sheaths and not split into filaments. Stems very slender, 1 to 1½ feet high, with few filiform branches. Pedicels solitary, recurved, filiform, ½ to ¾ in. long. Bracts very small. Perianth-segments narrow, about 5 lines long. Filaments short, papillose-hairy in the upper half; anthers linear, at least twice as long as the filament.

Queensland. Brisbane River, *Bailey.*

31. DICHOPOGON, Kunth.

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones much broader and sometimes slightly crisped or fringed on the edges. Stamens 6, attached to the base of the perianth or almost hypogynous, shorter than the segments; filaments short, flattened at the base, not bearded; anthers longer, erect, linear, with 2 small crest-like appendages at the base reflexed on the filament (and sometimes shortly adnate to it?); the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule globular, 3-valved. Seeds several, angular, black, the testa smooth or granular, not shining.—Tufted perennials, with the fibrous roots often thickened into tubers. Leaves radical, grass-like, with scarious sheathing bases. Stems simple or with a few long branches, leafless or with a short leaf under the lowest branch. Flowers purple lilac or rarely blue, in a long simple raceme at the end of each branch, solitary or 2 or 3 together within distant scarious bracts, the pedicels articulate at or above the middle.

The genus is limited to Australia. It was formerly included in *Arthropodium*, and may perhaps still be considered as a section only, distinguished by Kunth as having the appendages to the stamens attached to the anthers and not to the filament.

Capsules erect. Anther-appendages very short . . . . . 1. *D. strictus.*
Capsules reflexed. Anther-appendages rather long . . . . 2. *D. Sieberianus.*

1. **D. strictus,** *Baker in Journ. Linn. Soc.* xv. 319, *excl. syn.*—Radical leaves narrow-linear, varying in length from 3 or 4 in. to twice as much, always shorter than the stems, the older tufts often surrounded by numerous long filaments, the remains of old leaf-sheaths. Stems from under 1 ft. to above 2 ft. high, the scarious bracts under the branches and pedicels sometimes very narrow and small, sometimes broadly scarious, 3 lines long, besides a more or less lengthened terminal point. Flowers solitary or in clusters of 2 or 3 within each bract, and when more than one accompanied by small bracteoles within the bract, the clusters distant along the rhachis. Pedicels erect spreading or recurved, shorter or longer than the flowers. Perianth-segments usually 5 to 6 lines long, 3-nerved in the centre. Appendages to the base of the anthers usually short and crest-like. Fruiting pedicels erect or spreading, the capsule always erect.—*Arthropodium strictum*, R. Br. Prod. 276; F. Muell. Fragm. vii. 66; *A. laxum*, Hook f. Fl. Tasm. ii. 51, t. 131, not of Sieb.; *Dichopogon humilis*, Kunth, Enum. iv. 623, and probably also *D. setosus*, Kunth, l. c. 621; *D. undulatum*, Reg. Gartenfl. ii. 1, t. 37.

Queensland. Moreton Bay, *Fitzalan*; Darling Downs, *Leichhardt*; Rockhampton? *Bowman.*

N. S. Wales. Paramatta, *Woolls*; Bathurst Plains, *A. Cunningham*; Nangas, *M‘Arthur*; Goyinga Mountains, *Victorian Expedition.*

Victoria. From the Glenelg River and Port Phillip to the Murray, *Robertson*, *F. Mueller*, and many others.

Tasmania. Port Dalrymple, *R. Brown*; abundant in good soil throughout the island, *J. D. Hooker.*

S. Australia. Round St. Vincent's Gulf, *F. Mueller*; Yorke Peninsula, *Fowler.*

This species varies very much in stature, in the size and shape of the scarious bracts, in the flowers all solitary or all in clusters of 2 or 3, erect or pendulous, in the size of the perianth and length of the pedicels, but I have been unable to sort into distinct varieties the very numerous specimens I have had before me.

2. **D. Sieberianus,** *Kunth, Enum.* iv. 623.—Habit of the slender narrow-leaved specimens of *D. strictus.* Stems mostly about 1 ft. high, simple or slightly branched. Leaves very narrow. Flowers in clusters of 2 or 3 like those of *D. strictus*, but the pedicels reflexed from near the base. Appendages to the base of the anthers rather long and almost adnate to the filament. Capsules always reflexed.—*Arthropodium laxum*, Sieb. in Rœm. et Schult. Syst. vii. 441.

N. S. Wales. Port Jackson or Blue Mountains, *Sieber, n.* 194, *Vicary*; New England, *C. Stuart*; Head of the Gwydir, *Leichhardt*: Richmond, *Backhouse.*

Victoria. Wendu Vale, *Robertson.*

S. Australia. St. Vincent's Gulf and Murray Desert; *F. Mueller.*

The *Arthropodium fimbriatum*, R. Br. Prod. 276, of which no specimen is preserved in his herbarium, is probably this species, and possibly also the plant raised by Salisbury, for which he proposes (Gen. Pl. 67) the generic name *Siona.*

Baker, in Journ. Linn. Soc. xv. 319, distinguished the two species as *D. humilis* and *D. strictus*, chiefly by the pedicels usually solitary and ascending in the former, deflected and two or three together in the latter; but the very numerous and varied specimens since seen show that neither of these characters are at all constant, and the plant R. Brown had in view appears to me to be referable to the common form, and not to the closely allied species gathered by Sieber.

32. CHLOROPHYTON, Ker.

Perianth persistent, not twisted, of 6 distinct oblong or narrow 3-, 5-, or 7-nerved segments, the inner ones usually rather broader. Stamens 6, all hypogynous or those opposite the inner segments attached to their base, shorter than the perianth; filaments filiform or slightly compressed, glabrous; anthers oblong or linear, shorter than the filaments, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several (4 to 20) ovules in each cell superposed in 2 rows or very rarely reduced to 2 collateral ones; style filiform, with a terminal stigma. Capsule laterally 3-lobed, the lobes usually laterally compressed with an acute dorsal edge, 3-valved. Seeds few, sometimes only 1 in each cell, flattened with acute margins, laterally attached, the hilum more or less intruded; testa black, usually shining.—Perennials with fibrous roots often thickened into tubers. Leaves grass-like, radical or crowded at the base of the stem. Scapes simple or slightly branched. Flowers solitary or 2 or 3 together within scarious bracts, the clusters sessile along the scape in a terminal raceme.

There are a considerable number of species spread over the warmer regions of Asia and Africa. Of the two Australian ones, one has a wide range in tropical Asia, the other is endemic and extratropical.

Ovules usually more than 2 in each cell. Fruiting pedicel longer than the capsule. Tropical species	1. *C. laxum.*
Ovules 2 in each cell. Fruiting pedicel shorter than the capsule. Tasmanian species	2. *C. alpinum.*

1. C. laxum, *R. Br. Prod.* 277.—Root fibres more or less thickened into tubers. Leaves varying from a foot long or even more and scarcely above 1 line broad, to only a few inches long and 2 to 3 lines broad, erect or spreading, usually long and narrow in the Australian species. Scape shorter than the leaves, simple or once branched near the base, with few distant clusters of 2 or 3 flowers each, or sometimes only 1 flower within the scarious bract, often accompanied by 2 or more smaller scarious bracts or bracteoles within the outer one. Pedicels rather rigid, about 1 line long at the time of flowering but often 3 lines or more when in fruit. Perianth-segments narrow, scarcely 1½ lines long in the Australian and common Asiatic form, larger in some African specimens. Capsule nearly 3 lines broad but not so long, truncate at the top, with 2 to 6 seeds in each lobe or cell.—Baker in Journ. Linn. Soc. xv. 328, with the numerous synonyms there adduced; *C. serotinum*, F. Muell. Fragm. i. 63; *Phalangium parviflorum*, Wight, Ic. t. 2039; *Phalangium laxum*, F. Muell. Fragm. vii. 71.

N. Australia. Arnhem S. Bay, *R. Brown*; Sea Range, *F. Mueller.* Widely spread over tropical Asia and Africa.

2. C. alpinum, *Baker in Journ. Linn. Soc.* xv. 329.—Roots fibrous without tubers in the specimens seen, the plant otherwise closely resembling the small specimens of *C. laxum*. Scapes simple, 1 to 2 in. high. Leaves narrow, the longest 2 or 3 times as long as the scape. Flowers few together in the clusters, on very short pedicels, the perianth-segments 2 to 2½ lines long. Capsule as large as in *C. laxum*, but not seen quite ripe. Ovules only 2 in each cell in the flowers examined. Seeds flat, disk-shaped.—*Casia* (?) *alpina*, Hook. f. Fl. Tasm. ii. 373.

Tasmania. Western Mountains, *Archer.*

33. HERPOLIRION, Hook. f.

Perianth (persistent ?) of 6 linear equal segments, erect at the base, spreading from below the middle upwards. Stamens 6, attached to the base of the perianth and shorter than the segments; filaments filiform, anthers linear, erect, the cells opening inwards in longitudinal slits. Ovary sessile short, 3-celled, with several ovules in each cell; style filiform, with a terminal stigma. Fruit apparently capsular.—A dwarf stemless plant with solitary flowers almost sessile within the tufts of leaves.

The genus is limited to the single Australian species, which is also in New Zealand. In habit and inflorescence it differs widely from all other Australian *Liliaceæ*, but might perhaps be compared to *Baxtera.*

1. **H. Novæ-Zelandiæ,** *Hook. f. Fl. Nov. Zel.* i. 258.—Rhizome creeping, sending up numerous tufts of linear leaves, 1 to 2 in. long, their sheathing bases distichous and imbricated. Flowers solitary within the tuft, on an exceedingly short scape or peduncle, on which one or two of the upper or inner leaves are reduced to sheathing bracts shorter than the perianth. Perianth white or bluish, the segments 5-nerved, about ¾ in. long, spreading from a little below the middle. Anthers shorter than the filaments, shortly sagittate at the base. Fruit unknown, but from the slightly enlarged ovary probably capsular.—Baker in Journ. Linn. Soc. xv. 287; *H. Tasmaniæ*, Hook. f. Fl. Nov. Zel. i. 258 and Fl. Tasm. ii. 54, t. 132.

Victoria. Between the Murray and Snowy Rivers and on the Baw Baw Mountains, ascending to 4500 ft., *F. Mueller.*

Tasmania. Summits of the Western Mountains, Lake St. Clair, covering large patches of ground, *Gunn;* Hampshire Hills, *Milligan.*

34. SOWERBÆA, Sm.

Perianth persistent without twisting, of 6 oblong or ovate segments, all free or the inner ones shortly connate at the base. Stamens 3 perfect, opposite the inner segments at their base, with very short filaments, anthers erect divided to below the middle into 2 linear lobes opening laterally in longitudinal slits, the 3 opposite the outer lobes reduced to short filaments without anthers or entirely wanting. Ovary short, 3-celled, with 2 to 6 ovules in each cell. Style filiform, with a terminal stigma. Capsule 3-celled, enclosed in the persistent perianth, opening loculicidally in 3 valves. Seeds few, more or less angular, with a thick but scarcely crustaceous black testa minutely granulated. Embryo small, linear, in the centre of the albumen.—Tufted perennials with fibrous roots. Leaves at the base of the stem linear-filiform. Stems or scapes leafless, simple or rarely branched at the base, with a single terminal globular umbel of pink flowers, and small scarious imbricate bracts at the base of the pedicels.

The genus is limited to Australia.

Perianth-segments about 3 lines long, all free. Staminodia without anthers alternating with the perfect stamens.
  Perianth-segments oval-oblong. Anthers about half their length. Eastern species . . . . 1. *S. juncea.*
  Perianth-segments narrow-oblong. Anthers reaching to much above their middle. Western species . . . . 2. *S. laxiflora.*
Perianth-segments about 2 lines, the inner ones shortly united at the base. No staminodia. Northern species . . . . 3. *S. alliacea.*

1. **S. juncea,** *Sm. in Trans. Linn. Soc.* v. 160, *t.* 6.—Stems simple, slender, 1 to 2 feet high. Leaves at the base of the stem somewhat distichous, linear-filiform, terete, all short or some nearly as long as the stem, bordered at the base and sometimes up to nearly 2 in. with scarious transparent sheathing margins. Umbel many-flowered, the imbricate bracts either all very short and scarious or 2 or 3 of the outer

ones of a firmer consistence, rather larger and acute. Pedicels at first scarcely exceeding the bracts, lengthening as the flower expands, but rarely longer than the perianth. Perianth pink, the segments oval-oblong; 3 lines long or rather more, all affixed at about the same level. Anther-bearing filaments very short and flattened, alternating with as many nearly similar but without anthers; anthers usually attaining to about half the perianth, divided almost to their cordate base. Seeds usually about 3 in the capsule.—R. Br. Prod. 285; Andr. Bot. Rep. t. 81; Bot. Mag. t. 1104; Red. Lil. t. 341.

Queensland. Moreton Island, *M'Gillivray*, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 193, and *Fl. Mixt. n.* 521, *A. Cunningham*, and others; northward to Hastings River, *Beckler*; Richmond River, *Henderson*.

Victoria. Gipps' Land, Latrobe River, *F. Mueller*; Cape Howe, *Walter*.

2. **S. laxiflora,** *Lindl. Bot. Reg.* 1841, t. 10.—Very near *S. juncea*, with the same habit inflorescence and narrow grass-like leaves. Stems varying from very slender and under 1 ft. to rather stout and 1½ or 2 ft., and sometimes slightly branched at the base. Leaves crowded at the base of the stem but sometimes extending some way up, the sheaths less prominent than in *S. juncea* and sometimes not at all scarious. Umbels loose, the filiform pedicels often at length much longer than the perianth. Perianth pink, the segments about 3 lines long, much narrower than in *S. juncea*. Anthers reaching to considerably above the middle of the perianth, alternating with staminodia as in *S. juncea*.—F. Muell. Fragm. vii. 87.

W. Australia. King George's Sound to Swan River, *Drummond*, *1st coll. and n.* 782, *Preiss*, *n.* 1552, *F. Mueller*, and many others; Murchison River, *Oldfield*.

3. **S. alliacea,** *F. Muell. Fragm.* vi. 180.—Habit and foliage of the slenderer specimens of *S. juncea*, but with the stem sometimes slightly branched at the base. Inflorescence the same but the flowers much smaller. Perianth only 2 lines long, the segments rather broad, the 3 inner ones united at the base rather higher up the receptacle than the outer ones. Stamens about half the length of the perianth, the three short broad filaments closely contiguous, without any intervening staminodia.

N. Australia. Liverpool River, Arnhem's Land, *Gulliver*.

35. ALANIA, Endl.

Perianth persistent, of 6 equal narrow segments. Stamens 6, hypogynous, nearly as long as the perianth, filaments filiform; anthers small, ovate, the cells opening inwards by longitudinal slits. Ovary sessile, ovoid, 3-celled, with few ovules in each cell; style short, recurved, the stigma almost capitate. Capsule globular, opening loculicidally in 3 valves. Seeds few or only one in each cell, oblong, without any strophiole; testa crustaceous black smooth and shining.—Perennial with diffuse

stems, covered by the crowded linear leaves. Flowers in globular umbels on axillary peduncles.

The genus is limited to the single species endemic in Australia.

1. **A. Endlicheri,** *Kunth, Enum.* iv. 644.—Stems elongated in some specimens to above 1 ft., diffuse. Leaves crowded, linear-filiform, acute, 2 to 4 in. long, dilated at the base into brown scarious imbricate sheaths entirely concealing the stem. Peduncles axillary, filiform, shorter or rather longer than the leaves. Spikes forming at first globular heads of 3 to 4 lines diameter with very numerous closely imbricate brown scarious acute or acuminate bracts, 1 or 2 of the lowest often produced into leafy subulate points. As the flowering advances the filiform pedicels, one within each bract, lengthen to 2 or 3 lines, transforming the head into an umbel, the pedicels not articulate. Perianth-segments scarcely above 1 line long, and the capsule not larger.

N. S. Wales. Fissures of rocks, Blue Mountains, *A. and R. Cunningham, Miss Atkinson.*

Tribe X. Johnsonieæ.—Perianth-segments free or united in a tube at the base. Style filiform with a terminal entire stigma. Stock not bulbous. Flowers in dense heads or short spikes, solitary and sessile or nearly so within imbricate bracts.

36. LAXMANNIA, R. Br.

Perianth withering and persistent but not twisted, of 6 segments, the 3 outer ones distinct from the base, the 3 inner very shortly united at the base or almost free. Stamens 6, shorter than the perianth, 3 opposite the outer segments hypogynous or nearly so, 3 adnate to the middle of the inner segments; filaments filiform; anthers short, 2-lobed at the base, fixed on the back at the base of the lobes, the cells opening inwards in longitudinal slits. Ovary contracted at the base or almost stipitate, 3-celled, with 2 to 4 ovules in each cell; style shortly filiform, with a somewhat dilated entire stigma. Capsule enclosed in the perianth, 3-valved. Seeds few, black, not flattened, smooth but not shining, without any strophiole.—Perennials with fibrous roots not tuberous. Stems either short and densely tufted or elongated branched and diffuse. Leaves narrow-linear or subulate, in radical or terminal tufts, dilated at the base into scarious sheathing appendages, which are often produced at the top into simple or woolly-ciliate bristles. Flowers white or pink, in terminal pedunculate or sessile heads, with imbricate scarious bracts, the outer bracts empty usually entire and forming an involucre usually shorter then the perianths, the inner ones subtending each flower short very thin and transparent, jagged or fringed on the edge or more frequently divided to near the base into woolly hair-like segments, sometimes described as hairs of the receptacle.

The genus is limited to Australia. F. Mueller, Fragm. vii. 88, proposes to restore the name of *Laxmannia* to the Composite genus *Petrobium*, and to give to the present one the name of *Bartlingia*, but this disturbance of a long-adopted nomenclature would appear to me to be productive of much confusion, without any corresponding advantage.

Stems usually short and tufted. Peduncles very much longer than the leaves.
Outer perianth about 3 lines, inner less than half as long and broadly ovate . . . . 1. *L. grandiflora.*
Outer perianth about 2 lines, inner oblong, more than half as long.
Outer bracts few, obtuse, inner very short, fringed with long hairs . . . . 2. *L. squarrosa.*
Outer bracts more numerous, often acute, inner short and shortly jagged . . . . 3. *L. minor.*
Stems slender, elongated, branched and leafy. Peduncles slender, longer than the leaves.
Inner perianth-segments longer than the outer. Eastern species . . . . 4. *L. gracilis.*
Inner perianth-segments shorter than the outer. Western species . . . . 5. *L. ramosa.*
Heads sessile or on peduncles shorter than the leaves.
Stems slender, branched. Leaves usually elongated. Inner perianth-segments rather shorter or at length rather longer than the outer . . . . 6. *L. sessiliflora.*
Stems very short and densely tufted. Leaves mostly under ½ in long.
Leaves crowded along the short stems. Flower-heads rather broad, exceeding the leaves, the outer bracts numerous and obtuse . . . . 7. *L. brachyphylla.*
Leaves in terminal tufts longer than the heads. Outer bracts not numerous and mostly acute . . . . 8. *L. sessilis.*

1. **L. grandiflora,** *Lindl. Swan Riv. App.* 56.—Stems tufted when old, densely and shortly branched as in *L. squarrosa*. Leaves crowded as in that species but usually more erect, 1 to 2 in. long, the scarious sheaths terminating in long fringed bristles. Peduncles 6 to 10 in. long. Outer empty bracts of the head from 10 to 20, ovate, obtuse, scarious with brown centres, the outermost not 2 lines, the innermost above 3 lines long, the flowering ones about 4 lines and broadly oblong. Flowers 1, 2 or 3 within each bract on pedicels of ½ to 1 line, surrounded by long woolly hairs which fringe the base of the inner empty bracts or into which the subtending bracts are divided. Outer segments of the perianth oval-oblong, about 4 lines long, often very white, the inner ones broadly obovate, quite closed, about 1½ lines long. Stamens not exceeding the inner segments. Ovary stipitate.—F. Muell. Fragm. vii. 88.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 792.

Var. *paleacea.* This is a dwarf variety with short leaves which almost connects the species with *L. minor*, but it has the numerous obtuse empty bracts and the short broad inner perianth-segments of *L. grandiflora.*—*L. squarrosa*, Endl. in Pl. Preiss. ii. 42, not of Lindl.; *L. paleacea*, F. Muell. Fragm. i. 159.—Phillip's River, *Maxwell;* York District, *Preiss, n.* 1588; between Esperance Bay and Fraser's Range, *Dempster*, with very numerous outer empty bracts resembling the involucre of *Compositæ.*

2. **L. squarrosa,** *Lindl. Swan Riv. App.* 56.—Stems tufted when old, densely and shortly branched. Leaves crowded, almost subulate,

the lamina ½ to 1 in. long and straight or recurved, the sheathing imbricate bases with scarious margins produced at the top into bristles fringed with long hairs. Peduncles slender, more than twice the length of the leaves. Flower-heads when fully out 3 to 4 lines diameter or rarely more, ovoid when young, at length nearly hemispherical; outer empty bracts rather numerous, more acute than in *L. grandiflora*, the inner ones nearly as long as the flowers and often fringed at the base, those subtending the flowers very shortly entire at the base but fringed with numerous long hair-like segments. Perianth sessile or nearly so, the outer segments about 2 lines long, the inner oblong and more than half that length.—*L. grandiflora*, *L. acuta*, *L. pauciflora*, and *L. sylvestris*, Endl. in Pl. Preiss. ii. 42.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 36, 793, and 794; *Preiss, n.* 1586, 1589, 1591, 1592. The *L. pauciflora*, Endl. (Preiss, n. 1589), is, however, included here on the authority of Mr. Baker, who has seen the typical specimen. I have myself examined the others.

3. **L. minor,** *R. Br. Prod.* 286.—Very nearly allied to *L. squarrosa*. Stem short and tufted. Leaf-sheaths more ciliate than in *L. squarrosa*, and often rather densely covered with intricate woolly hairs, the blade ½ to ¾ in. long. Flower-heads on slender peduncles of 2 to 4 in. Outer bracts very few and much shorter than the perianths, the inner flowering ones very short and shortly fringed. Perianth often very white, as in *L. grandiflora*, about 2 to 2½ lines long, the inner segments more than half as long as the outer.—*L. Roei*, Endl. in Pl. Preiss. ii. 42; F. Muell. Fragm. vii. 88.

W. Australia. King George's Sound and adjoining districts, *R. Brown, Preiss, n.* 1585, *Oldfield, F. Mueller*, and others. In Brown's specimens the perianth is not white, but they are evidently starved and faded.

4. **L. gracilis,** *R. Br. Prod.* 286.—Stems slender, branched, forming loose tufts of 1 ft. or more. Leaves crowded at the base and ends of the branches, leaving leafless intervals of ½ to 1 in., the short broad sheathing scarious bases imbricate with a few woolly hairs on their margins, the blades filiform, erect or spreading. ½ to 1 in. long or in starved specimens shorter. Flower-heads small, on slender peduncles of several inches. Outer empty bracts few, very thin and transparent, ovate, quite entire and glabrous, 1 to 2 lines long; inner flowering ones short, more or less fringed with narrow teeth or ciliate with long woolly hairs at the base. Flowers pink, very shortly pedicellate or almost sessile, the segments about 2 lines or at length nearly 3 long, the outer ones rather shorter than the inner. Ovary contracted into a short stipes.—F. Muell. Fragm. vii. 88.

Queensland. Dawson River, *F. Mueller;* Rockhampton, *O'Shanesy.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 169, and *Fl. Mixt. n.* 522, and many others: northward to New England, *C. Stuart, Leichhardt;* Clarence River, *Beckler, Wilcox;* Liverpool Plains, *A. Cunningham;* southward to Illawarra, *A. Cunningham.*

Victoria. Mount Lizar and M'Alister River, *F. Mueller.*

Var. *illecebrosa* (?). Scarious sheathing bases of the leaves larger and more woolly hairy.—*L. illecebrosa*, Reichb. f. Beitr. Syst. Pflanzenk. 72 (?)—Herbert River, Queensland, *Armit.* I have not seen Frau Dietrich's specimens described by Reichenbach, but I do not see any character given to distinguish them specifically from the *L. gracilis*, which varies much in the degree of development of the branches, foliage, and inflorescence.

5. **L. ramosa,** *Lindl. Swan Riv. App.* 56.—Closely resembles *L. gracilis* in its long much-branched slender almost filiform stems with tufts of leaves separated by bare intervals, the filiform peduncles not quite so long. Flower-heads bracts and perianths the same as in that species, except that the inner segments of the perianth are rather shorter than the outer, even in the full-grown flower.—Endl. in Pl. Preiss. ii. 43; F. Muell. Fragm. vii. 88.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1587.

6. **L. sessiliflora,** *Dcne. Herb. Tim. Descr.* 35, *t.* 16.—Stems much-branched, sometimes elongated and filiform; sometimes contracted into small dense leafy tufts. Leaves in tufts at the base of the branches and under the flower-heads and occasionally one or two small ones in the intervals, the sheaths very short with the scarious margins entire or jagged, the blade very narrow and rarely ½ in. long. Flower-heads sessile within the leafy tufts, the outer scarious bracts very few, entire, shorter than the perianth, the inner ones under the flower shorter, mostly fringed with narrow teeth or woolly hairs. Flowers few in the head and sometimes solitary. Perianth scarcely 2 lines long, the segments narrow, the outer ones almost acute, at first rather longer but sometimes at length usually rather shorter than the inner obtuse ones.—*L. minor*, Hook. f. Fl. Tasm. ii. 60; F. Muell. Fragm. vii. 89, not of R. Br.

Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller*, *Sullivan*; Wilson's Promontory, *F. Mueller.*

Tasmania. Heathy places; abundant in some of the northern parts of the island, *J. D. Hooker.*

S. Australia. Encounter Bay, *Whitaker*; Lofty Ranges, *F. Mueller.*

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 795; Port Gregory and Murchison River, *Oldfield*; Phillips and Kalgan Rivers, *Maxwell.*

Decaisne figures the inner segments of the perianth as decidedly longer than the outer, and I have occasionally found them so, especially in Murchison River specimens, but they are most frequently as decidedly shorter, although perhaps growing out as the flowering advances. The specimens described by Decaisne were most probably from Shark's Bay.

7. **L. brachyphylla,** *F. Muell. Herb.*—A dwarf plant, rarely above 1 in. high, allied to *L. sessilis* and perhaps a variety, but much less branched. Leaves shorter and not so fine, occupying the greater part of the branches, the sheaths terminating in fringed appendages rather than in bristles. Flower-heads much broader with more numerous flowers and borne on peduncles of 1 to 2 lines. Outer bracts numerous and obtuse as in *L. grandiflora*; inner bracts divided nearly to the

base into woolly hairs as in *L. sessilis*, and perianths entirely as in that species.

W. Australia. King George's Sound or to the eastward, *Baxter*, and probably the same region, *Drummond*, *n.* 445; East Mount Barren, *Maxwell*; Upper Kalgan River and Perongerup, *F. Mueller*; between Esperance Bay and Fraser's Range, *Dempster*.

8. **L. sessilis,** *Lindl. Swan Riv. App.* 56.—Stems branched and densely tufted, the whole plant rarely above 1 in. high, the lower part of the branches covered with scarious leaf-sheaths. Leaves forming short terminal tufts, very narrow-linear, recurved, 3 to 8 lines long, the bristles of the sheaths few and long, simple or slightly divided. Flower-heads ovoid or oblong, sessile or nearly so, shorter than the leaves. Outer bracts not very numerous, mostly acute; inner ones divided nearly to the base into woolly hairs. Perianth sessile or nearly so, the outer segments about 2½ lines long, the inner ones ovate-oblong about ¾ lines long.—Endl. in Pl. Preiss. ii. 42.

W. Australia. Swan River, *Drummond*, *1st coll.*; Hay District, *Preiss*, *n.* 1590; north of Stirling Range, *F. Mueller* (the latter specimens not fully out and somewhat doubtful).

37. STAWELLIA, F. Muell.

Perianth of 6 equal 3-nerved segments, shortly united at the base. Stamens 3, inserted at the base of the inner segments and shorter than them; filaments filiform or flattened; anthers linear or linear-lanceolate, erect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 ovules in each cell; style filiform entire. Capsule opening loculicidally in 3 valves. Seeds 1 or 2 in each cell, with a black shining crustaceous testa.—A tufted perennial, with linear filiform radical leaves, and simple scapes. Flowers in a dense terminal head, with imbricate bracts, the outer ones produced into filiform leaves.

The genus is limited to the single species endemic in West Australia.

1. **S. dimorphantha,** *F. Muell. Fragm.* vii. 85.—A slender glabrous perennial, forming dense tufts of 4 to 5 in. Leaves all radical except those of the flower-heads, linear-filiform, shorter than the scapes, with scarious imbricated dilated bases. Stems simple, rigidly filiform. Flower-heads 3 or 4 lines diameter, surrounded by rigidly filiform leaves or summits of the outer bracts often 1 in. long. Rhachis of the head or spike often branched though close and compact. Bracts scarious, imbricate. Flowers solitary and sessile within them, a few of the outer perianths in each head very narrow linear and 3 lines long, the others much shorter and broader. Filaments of the outer flowers filiform, of the inner ones short and flat. Capsule very small, enclosed in the perianth.

W. Australia. *Drummond.*

The remarkable difference in shape of the outer and inner flowers may be partly but not entirely caused by a difference in the degree of development. I have not succeeded in finding ripe capsules or seeds in any of the specimens, and have described them after F. Mueller.

38. JOHNSONIA, R. Br.

Perianth withering after flowering but at length deciduous, of 6 equal 3- or 5-nerved segments. Stamens 3, attached to the base of the inner segments and shorter than the perianth; filaments shortly dilated and connate at the base, tapering upwards; anthers linear, erect, continuous with the filament, the cells opening inwards in longitudinal slits. Ovary 3-celled, with two ovules in each cell, one erect the other pendulous; style filiform, with a terminal small stigma. Capsule nearly globular, opening loculicidally in 3 valves. Seeds 1 or 2 in each cell, oblong or ovoid, the funicle thickened into a black strophiole; testa crustaceous, black, smooth, and shining. Embryo linear, straight.—Tufted herbs, with radical leaves and a simple leafless stem. Flowers in oblong terminal spikes, entirely concealed within large imbricate dry glume-like bracts, of which one or two of the lowest are usually empty, and the lowest of all occasionally produced into a subulate leaf, erect and apparently continuous with the stem.

The genus is confined to West Australia.

Glabrous, 1 ft. high or more. Leaf-sheaths distichous. Spikes 1½ to 2 in., the bracts not ciliate	1. *J. lupulina.*
Pubescent or hirsute, under 1 ft. Leaf-sheaths scarcely distichous. Spikes ¾ to 1½ in., the bracts ciliate	2. *J. pubescens.*
Usually pubescent. Spikes sessile within the leaves or on a stem shorter than themselves	3. *J. acaulis.*

1. **J. lupulina,** *R. Br. Prod.* 287.—Stems flattened, 1 to 1½ ft. high. Leaves few at the base of the stem, with distichous sheaths, the blade erect, the longest usually shorter than the stem and laterally flattened as in Irideæ, varying in breadth from under 1 line to nearly 2 lines. Spikes 1½ to 2 in. long. Bracts imbricate all round, rigid and glume-like, varying from a pale straw-colour to a rich brown when dry, mostly 6 to 9 lines long, broadly lanceolate and concave, each with a single sessile flower in the axil, the perianth about half as long as the bract, the lower bracts of the spike gradually smaller and empty, the lowest of all often but not always and sometimes the lowest two with the midrib produced into an erect terete leaf of ½ to 1 in., all the bracts quite glabrous without cilia on their margin.—Bauer, Illustr. t. 1; Endl. in Pl. Preiss. ii. 40; F. Muell. Fragm. vii. 86.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *A. Cunningham*, *Drummond*, *n.* 211 *and* 350, *Preiss*, *n.* 1579, and many others.

Var. *teretifolia.* Leaves very narrow, terete or flat, not apparently so regularly distichous as in the typical form, but the specimens none of them very perfect. *J. teretifolia*, Endl. in Pl. Preiss. ii. 40.

W. Australia. Stirling Range, *F. Mueller*; Cape Riche, *Preiss*, *n.* 1582; Swan River, *Helmich.*

2. **J. pubescens,** *Lindl. Swan Riv. App.* 57.—Much smaller in all its parts than *J. lupulina*, and more or less pubescent or hirsute. Leaves not distichous, very narrow, flat or terete, 6 in. to 1 ft. long or more.

Stems slender, usually 4 to 6 in. long and always shorter than the leaves. Spikes ¾ to 1 in. long, the bracts very pointed, rarely above ½ in. long, some or all of them more or less ciliate on the edges, the small lower empty ones usually not above 2 or 3, and the lowest less frequently produced into a leaf than in *J. lupulina.*—*J. hirta*, Lindl. Swan Riv. App. 57, t. 7; F. Muell. Fragm. vii. 87. *J. longifolia*, Endl. in Pl. Preiss. ii. 40.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 210, 351, *and* 797, *Preiss, n.* 1584; Cape Naturaliste and Canning River, *Oldfield.*

Var. *filifolia*, F. Muell. Leaves almost filiform.—*J. mucronata*, Endl. in Pl. Preiss. ii. 40; Swan River, *Drummond, Preiss, n.* 1580.

3. **J. acaulis,** *Endl. in Pl. Preiss.* ii. 41.—A dwarf plant usually pubescent but sometimes nearly glabrous. Leaves scarcely distichous, rigid and flat but rarely above 1 line broad and 3 to 6 in. long. Spikes sessile within the leaves or borne on stems shorter than themselves, the bracts or glumes of a rich brown, very pointed and ciliate on the edges as in *J. pubescens*, but more loosely imbricate.—A variety only of *J. pubescens* in the opinion of F. Muell. Fragm. vii. 87.

W. Australia. Foot of Stirling Range, *F. Mueller, Preiss, n.* 1581, and probably in the same region, *Drummond, n.* 202, 203, 352 *and* 353.

39. **ARNOCRINUM,** Endl. and Lehm.

Perianth hypocrateriform, the tube cylindrical, the limb spreading, of 6 equal broad 1-nerved segments. Stamens 3, attached to the mouth of the tube, alternating sometimes with small filiform staminodia; filaments short, filiform; anthers 3, connate in a cylinder round the style, dorsally attached a little above the base, opening inwardly in longitudinal slits. Ovary sessile, obovoid, with 2 ovules in each cell, one erect the other pendulous; style filiform, the stigmatic end slightly thickened. Capsule 3-valved, enclosed within the bracts. Seeds ovoid or globular, without any strophiole; testa crustaceous, black, smooth and shining.—Stems from a tufted densely woolly base long branching and rush-like, leafless except a small scale under each branch, rarely produced into a short leaf. Leaves radical or from the stock, linear, grass-like but short. Flowers in dense terminal ovoid heads or short spikes, sessile within the imbricate bracts.

The genus is limited to West Australia. The flowers have been described as hexandrous, but I have never found more than three stamens in several flowers I have examined of both species, and this accords with Oldfield's notes taken from the living plant.

Bracts more or less scarious, quite glabrous or rarely bordered by a few woolly hairs	1. *A. Drummondii.*
Bracts dry and brown, densely covered with long woolly hairs	2. *A. Preissii.*

1. **A. Drummondii,** *Endl. in Pl. Preiss.* ii. 41.—Stock or base of the stem enveloped in a dense white wool, the whole plant otherwise

glabrous or with a few woolly hairs near the base. Radical leaves narrow-linear, 2 to 3 in. long. Stems slender, simple or branched, 1 to 2 ft. high, with sometimes a little wool at the base of the branches. Flower-heads or spikes ovoid, about ½ in. long or rather more without the perianths, quite glabrous except a few woolly hairs bordering some of the bracts. Bracts imbricate, 3 to 4 lines long, either wholly scarious or the broad centres of some of the outer ones green rigid and striate. Perianth-tube narrow, cylindrical, about 3 lines long, the limb longer, blue, with 6 broad lobes, all 1-nerved according to Oldfield's notes, but of so delicate a texture as to be very imperfectly preserved in the dry specimens.

W. Australia. Swan River, *Drummond*, 1*st coll. n.* 777, *Preiss*, *n.* 2640; Murchison River, *Oldfield*.

2. **A. Preissii,** *Lehm.*, *Pl. Preiss.* ii. 42.—Very near *A. Drummondii*, but rather stouter, more rigid and more branched, sometimes producing tufts of short leaves at the bifurcations. Flower-heads of the same size, but the bracts all dry and brown, and densely covered with long woolly hairs. Perianth apparently smaller, but imperfect in the dried specimens.

W. Australia. Swan River, *Drummond*, 1*st coll. n.* 778, *Preiss*, *n.* 2226; Murchison River, *Oldfield*.

40. BORYA, Labill.

Perianth withering but persistent, hypocrateriform, the tube slender, cylindrical, the limb of 6 spreading nearly equal linear lobes. Stamens 6, inserted at the base of the lobes and as long as them or nearly so; filaments filiform; anthers short, erect, ovate-sagittate, the cells opening inwards in longitudinal slits. Ovary sessile, ovoid, 3-celled, with several (about 20) ovules in each cell, superposed in two rows; style filiform, with a small capitate stigma. Capsule enclosed amongst the persistent bracts, 3-valved. Seeds few, with a black crustaceous testa, without any strophiole.—Perennials with the stems either very short and tufted or elongated and branched, always densely covered with the closely imbricated persistent bases of the leaves. Leaves narrow-linear subulate or almost filiform, much crowded on the stock or on the upper part of the stems when elongated. Flowers in globular or ovoid heads on long peduncles. Bracts densely imbricated, a few of the outer ones empty, subulate, forming an erect or spreading involucre, the inner ones broad, usually obtuse, brown or black, each with a single flower sessile in its axil, the tube enclosed in a bracteole similar to the bract but broader, with inflected scarious margins.

The genus is limited to Australia.

Leaves various. Peduncle rarely above 3 in. Outer bracts usually longer than the flower head. Western species . . . . 1. *B. nitida*.

Leaves all erect subulate. Peduncle 6 to 10 in. Outer bracts rarely exceeding the head. North-eastern species . . . . 2. *B. septentrionalis*.

1. **B. nitida,** *Labill. Pl. Nov. Holl.* i. 81, *t.* 107.—A densely tufted perennial or low shrub, very variable in aspect according to age and situation, sometimes forming short tufts with the leaves almost radical and scape-like peduncles, but the stems often growing out to 6 in. or more, diffuse creeping or rarely erect, simple or branched, the lower portion covered with the persistent imbricate bases of the leaves and occasionally rooting. Leaves crowded in the upper portion, erect spreading or recurved, from under 1 in. to above 2. in. long, always ending in rigid pungent points. Scapes or peduncles erect, simple, rarely above 3 in. long. Flower-heads from ovoid to depressed-globular, 4 to 6 lines diameter. From 3 to 7 of the outer bracts empty, lanceolate-subulate or linear, very rigid and pointed, and some or all of them longer than the head; inner flowering bracts brown or black, 2 to 4 lines long, all very obtuse or a few of the outer ones almost acute or empty and passing into the involucral bracts. Bracteoles enclosing the flowers as long as the bracts. Perianth-tube as long as the bract, the lobes linear and nearly the same length.—R. Br. Prod. 286; F. Muell. Fragm. vii. 87; *B. lucens*, Poir. Dict. viii. 615 (probably a clerical error for *B. nitida*, though taken up by Kunth. Enum. iv. 645, as distinct); *Baumgartenia nitida*, Spreng. Syst. ii. 91.

W. Australia. Apparently abundant from King George's Sound, *Brown*, *Labillardière*, and many others, to Swan and Murchison Rivers, *Drummond*, *Oldfield*, and many others, and eastward to Cape Arid, *Maxwell*.

The aspect of the specimens varies so much that the inspection of a few only has induced the establishment of several species, but they are connected by so many intermediates that it becomes difficult to define distinct varieties. In the commonest form the leaves are slender, rarely above 1½ in. long, spreading or recurved, especially in the short tufted state, straighter and more rigid in the more elongated and branched forms or states. The former state includes *B. scirpoidea*, Lindl. Swan Riv. App. 57, t. 9; Drummond's specimens, *n.* 341; Preiss's *n.* 1597, etc. The latter is Labillardière's original form and that to which Brown gave Labillardière's name, as well as Drummond's *n.* 796 (1*st coll.*), Preiss's *n.* 1593, etc.

B. gracilis and *B. cataractæ*, Endl. Pl. Preiss. ii. 43, Preiss, *n.* 1596 and 1594 are small states of the common form.

B. sphærocephala, R. Br. Prod. 286 (*B. lucens*, Endl. in Pl. Preiss. ii. 43, Preiss, *n.* 1595; *Baumgartenia sphærocephala*, Spreng. Syst. ii. 91), is a large variety with rigid leaves sometimes nearly 1 line broad and nearly 2 in. long, but connected with the common fine-leaved form by numerous intermediates.

B. sublanosa, F. Muell. Herb., Drummond, *n.* 98, is a dwarf variety with the younger leaves more or less sprinkled with long loose woolly hairs.

Maxwell's specimens from Cape Arid show a remarkably rigid variety.

2. **B. septentrionalis,** *F. Muell. Fragm.* v. 41.—Stems short, erect. Leaves in dense tufts, very erect and rigid though fine, 1½ to 2 in. long. Peduncles 6 to 10 in. long. Flower-heads ½ to ¾ in. diameter, with very numerous flowers, the flowering bracts longer than in *B. nitida*, and the outer involucral bracts usually shorter than the head. The structure of the flowers and other characters precisely the same as in *B. nitida*, from which this species is most distinctly separated by geographical position.

Queensland. Fissures of rocks, Rockingham Bay, *Dallachy*.

Order CXXVIII. PONTEDERACEÆ.

Flowers usually slightly irregular, hermaphrodite. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured petal-like lobes or segments, imbricate in 2 series, all nearly equal and similar. Stamens 6 or 3, attached to the base of the lobes or segments, often dissimilar; anthers 2-celled, opening laterally or inwards by longitudinal slits or terminal pores. Ovary superior, 3-celled or with 3 parietal placentas, with 1 or more ovules to each cell or placenta; style single with a terminal 3-lobed or 6-toothed stigma. Fruit a capsule, opening loculicidally in 3 valves, but sometimes enclosed in the persistent tube of the perianth. Seeds albuminous, with a slender embryo, the radicle next to the hilum.—Aquatic herbs. Leaves usually petiolate, with numerous parallel veins. Flowers blue or white, in spikes or racemes proceeding from the sheath of the last or only leaf of the scape, usually with 1 or 2 sheathing bracts at the base of the peduncle.

A small order dispersed over the tropical and sub-tropical regions of both the New and the Old World, extending in North America to more temperate districts. The only Australian species belongs to a genus confined to the Old World, whilst the other genera are exclusively American. The order only differs from Liliaceæ in the aquatic habit and the slight irregularity of the flower.

1. MONOCHORIA, Presl.

(Limnostachys, *F. Muell.*)

Perianth nearly regular, divided to the base into 6 segments. Stamens 6, 1 usually larger or otherwise different from the others. Ovary 3-celled, with numerous ovules in each cell.—Leaves radical on long petioles. Scapes with a single apparently petiolate leaf, the short raceme in its axil appearing to proceed from a swelling in the middle of the petiole.

The genus contains very few species limited to the Old World; the only Australian one is, as far as known, endemic.

1. **M. cyanea,** *F. Muell. Fragm.* viii. 44.—Stems or rhizomes creeping in mud or shortly ascending in water, covered with long thin membranous sheathing scales, one or two of the lower ones produced into a leaf or a long petiole, the lamina ovate, acuminate, rounded or cordate at the base, 1½ to 3 in. long. Scapes from the axils of the upper sheaths with their terminal leaves at first resembling the lower leaves with a similar lamina, but with a swelling in the middle of the petiole which proves to be the sheathing base of the single leaf, from whence issues a shortly pedunculate loose spike or raceme of 3 to 10 flowers, the base of the peduncle enclosed in a membranous sheath. Flowers sessile or very shortly pedicellate, without bracts. Perianth blue, the segments 5 or 6 lines long or at length rather more, shortly united at the base. Filaments dilated, all nearly equal, without any tooth, one anther often a little longer or smaller than the others but sometimes scarcely different, all opening at first in terminal pores which are afterwards slit down to the

base. Seeds ovoid, with 10 to 12 prominent ribs.—*Limnostachys cyanea*, F. Muell. Fragm. i. 24.

N. Australia. Upper Victoria River, *F. Mueller*; Gilbert River, *Gulliver*.

Queensland. Port Denison, *Fitzalan*; Burdekin River, Rockhampton and neighbourhood, *Bowman*, *Thozet*, *O'Shanesy*, and others.

The species is very near to the common East Indian *M. vaginalis*, Presl, but the flowers are more sessile, and the stamens are nearly equal without the tooth on the filament of the odd stamen characteristic of both the Indian species.

ORDER CXXIX. PHILYDRACEÆ.

Flowers hermaphrodite, irregular. Perianth inferior, persistent, divided to the base into 2 broad petal-like segments, anterior and posterior. One perfect stamen, attached to the base of the anterior segment or almost hypogynous; filament flattened; anther variously shaped, attached at the base or adnate, with 2 parallel cells, straight or twisted, opening in longitudinal slits; staminodia 2, hypogynous, alternating with the perianth-segments, flat and somewhat petal-like but small, free or more or less connate at the base with the anther-bearing filament. Ovary superior, 3-celled or with 3 parietal placentæ, projecting far into the cavity; style terminal, simple, with a small or broad terminal stigma; ovules numerous in each cell or placenta, anatropous. Fruit a capsule, opening loculicidally in 3 valves. Seeds numerous, small; testa membranous. Embryo small, at the base of a fleshy albumen.—Erect herbs. Leaves linear or flag-like. Flowers sessile and solitary within more or less sheathing bracts along the rhachis of a simple spike, or along the simple branches of a terminal panicle.

The order is limited to the three Australian genera, and is almost endemic. One species only extends into east tropical Asia, and one of uncertain origin may be a native of the Pacific Islands.

Anther terminal, very much twisted. Ovary imperfectly 3-celled. Leaves flag-like. Spike long, simple . . . 1. PHILYDRUM.
Anther not twisted but reflexed outwards. Ovary perfectly 3-celled. Leaves few, narrow. Spike short, simple . . 2. PRITZELIA.
Anther erect, on a very short filament. Ovary perfectly 3-celled. Leaves flag-like. Spikes in a terminal branched panicle . . . . 3. HELMHOLTZIA.

1. PHILYDRUM, Banks.

Perianth-segments many-nerved, the margins slightly involute in the bud. Stamen attached to the base of the anterior segment and not exceeding it; filament flattened, tapering upwards; anther terminal, transverse, the cells excessively twisted; staminodia hypogynous, but often slightly connate at the base with the anther-bearing filament. Ovary 1-celled, with 3 parietal placentæ projecting far into the cavity but not meeting in the centre, each with 2 divaricate broad lobes covered on the inner or under surface with very numerous ovules; style columnar, with a terminal broad 3-angled stigma. Capsule oblong, opening loculicidally in 3 valves. Seeds very numerous and small, narrow-oblong, brown with black tips, minutely tuberculate, with a short pale funicle. —Tall perennial, with flag-like leaves. Flowers sessile within sheathing bracts along the rhachis of a long terminal spike.

The genus is limited to the single Australian and East Asiatic species, the *P. glaberrimum* of the 'Botanical Magazine' being a species of *Helmholtzia.*

1. **P. lanuginosum,** *Banks in Gærtn. Fruct.* i. 62.—Roots fibrous. Stem erect, simple or scarcely branched, about 2 ft. high, with more or less of white wool especially on the inflorescence, wearing away with age. Leaves from under 1 ft. to 1½ ft. long, distichous sheathing and equitant at the base of the stem, the upper ones shorter and passing into short lanceolate or ovate-lanceolate sheathing bracts, all however longer than the perianth, the inflorescence forming a long terminal interrupted spike, more woolly than the rest of the plant. Flowers closely sessile, solitary or rarely two together within each bract. Perianth-segments yellow, hairy, about ½ in. long and nearly as broad. Capsule about ½ in. long, the pericarp thin, opening tardily in 3 valves.—R. Br. Prod. 265; Kunth, Enum. iii. 380; Guillem. Ic. Pl. Austral. t. 5; Bot. Mag. t. 783.

N. Australia. Port Darwin, *Schultz, n.* 444.

Queensland. Sandy Cape, Keppel Bay, Broad Sound, *R. Brown*; Rockhampton and neighbourhood, *Bowman, O'Shanesy*, and others; Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*; Cape York, *Daemel.*

N. S. Wales. Port Jackson and Shoalwater Bay, *R. Brown*; New England, *C. Stuart*; Hastings River, *Beckler*; Clarence River, *Wilcox*; Mount Elliott, *Fitzalan.*

Victoria. Upper part of the Wimmera, *Wilhelmi.*

The same species ranges over the Malayan Peninsula and Archipelago and South China.

2. PRITZELIA, F. Muell.

(Hetæria, *Endl.*)

Perianth-segments many-nerved. Stamen almost hypogynous, at the base of the anterior segment; filament broad and flat, connate to about the middle with the 2 lateral petal-like staminodia; anther oblong, abruptly reflexed outward from the apex of the filament, the cells parallel, not twisted, opening in longitudinal slits. Ovary perfectly 3-celled; style columnar, with a slightly dilated terminal stigma. Capsule oblong, membranous, opening loculicidally in 3 valves, leaving a persistent central placentiferous column. Seeds numerous, small, oblong, brown, minutely tuberculate.—A small plant with a simple erect stem, few narrow leaves. Flowers sessile within concave bracts in a short terminal spike.

The genus is limited to the single West Australian species.

1. **P. pygmæa,** *F. Muell. Descr. Pap. Pl.* i. 13.—Stock apparently perennial, almost thickened into a small bulb more or less woolly, the rest of the plant glabrous. Stem simple, slender, erect, 3 to 6 in. high. Leaves 1, 2, or 3, narrow-linear, shorter than the stem, with a narrow sheathing base, the uppermost one with a broader sheath and short lamina. Flowering-bracts sheathing, 3 to 6 lines long without any or

only a very short point, distichous and imbricate when young, forming an interrupted terminal spike when in flower. Perianth-segments very broadly ovate, not at all or scarcely exceeding the bract. Stamen considerably shorter.—*Philydrum pygmæum*, R. Br. Prod. 265; *Hetæria pygmæa*, Endl. in Pl. Preiss. ii. 45.

W. Australia. King George's Sound, *R. Brown*, *Preiss*, *n.* 2223, *F. Mueller*; Swan River, *Drummond*, *1st coll. and n.* 739, 740; Lake Muir, *Muir.*

3. HELMHOLTZIA, F. Muell.

Perianth-segments faintly several-nerved, ovate-lanceolate, membranous, almost petal-like, the posterior one with 2 prominent nerves near the margin. Stamen almost hypogynous at the base of the anterior segment; filament very short and flat; anther erect, ovate-oblong, much longer than the filament, the cells parallel, not twisted, opening inwardly in longitudinal slits; staminodia petal-like, short and broad, very shortly connate with the anther-bearing filament. Ovary perfectly 3-celled; style subulate with a minute terminal stigma. Capsule nearly globular, 3-furrowed, the pericarp rather thick but probably at length 3-valved. Seeds numerous, small, dark-brown, smooth.—Tall erect perennial, with long almost radical flag-like leaves and numerous small flowers in a terminal pyramidal panicle.

Besides the Australian species, which is endemic, the genus includes the *Philydrum glaberrimum*, Hook. Bot. Mag. t. 6058, of uncertain origin, but believed to have been from the Pacific Islands.

1. **H. acorifolia,** *F. Muell. Fragm.* v. 203.—Stems erect, simple except the inflorescence, 2 to 3 ft. high, quite glabrous or with a slight wool about the inflorescence. Leaves nearly radical, flag-like, erect, 2 to 3 ft. long and ½ to near 1 in. broad, their short sheathing bases distichous and imbricated. Flowers in a dense terminal pyramidal panicle of 6 in. to 1 ft., sessile along its branches, within lanceolate acuminate bracts, spreading under the flower and scarcely exceeding it. Perianth-segments white, with inflexed margins, 3 or scarcely 4 lines long. Capsules 2 to 3 lines diameter, woolly-villous, not seen open although the seeds appear ripe with a perfect embryo. Seeds oblong, many of them truncate or almost hooked at the apex, and sometimes narrowly winged.

Queensland. Rockingham Bay, *Dallachy.*
N. S. Wales. Richmond River, *Wilcox.*

ORDER CXXX. XYRIDEÆ.

Character and geographical range of the order the same as that of the typical genus *Xyris*, in so far as connected with Australia; how far this character should be extended so as to comprise the American genera often associated with it, is as yet far from being settled. The affinities of the genus or order are also very uncertain. Either the habit or the seeds or the inflorescence have suggested to various botanists its approximation to Restiaceæ, Commelynaceæ, or Liliaceæ (*Johnsonieæ*), but there are important characters which separate it from each of these.

1. XYRIS, Linn.

Flowers hermaphrodite, sessile within 2 opposite persistent navicular bracteoles by some considered as outer perianth-segments. True perianth with a short tube, the limb divided into 4 segments, 1 outer anterior one thin and almost petal-like or somewhat scarious, very broad, completely enveloping the inner segments, but becoming detached at the base and cast off as the flower expands, 3 inner broad yellow petal-like spreading segments, withering after flowering. Perfect stamens 3, opposite the inner segments, attached to their base and shorter than them; anthers erect, sagittate, with 2 cells opening laterally in longitudinal slits somewhat turned outwards; staminodia usually 3, alternating with the inner segments, short and filiform, with a terminal tuft of jointed hairs or an imperfect anther, or in some species wholly deficient. Ovary sessile, imperfectly 3-celled; ovules numerous on 3 placentas, either basal and confluent or elongated parietal and quite distinct, or sometimes separating from the sides of the ovary except at the base and apex. Style single, divided at the end into 3 spreading branches, each terminating in a capitate or dilated stigma. Capsule globular or ovoid, often 3-furrowed, opening loculicidally in 3 valves or sometimes circumsciss, the hardened apex falling off entire. Seeds small and numerous, linear or oblong, usually striate; embryo lenticular, applied to the extremity of the albumen furthest from the hilum.—Tufted perennials or rarely annuals. Leaves radical or surrounding the base of the scape or stem, linear and grass-like or rigid and subulate or rush-like. Flowers solitary and sessile within imbricate rigid glume-like scales, forming a terminal head or short spike on a simple leafless scape, the outer bracts of the head usually empty and in some varieties of various species somewhat enlarged into a small involucre.

The genus is widely spread over the warmer regions both of the New and the Old World. Of the Australian species, one is identical with a common Asiatic one, the others are, as far as hitherto ascertained, all endemic.

I have described the 2 outer navicular scarious or glume-like organs outside the perianth as bracteoles from their position at the base of the perianth as well as from their consistence and persistence, whilst the broad segment enveloping the inner ones is evidently the real outer perianth, being placed like the inner segments at the apex of the tube.

Placentas of the ovary parietal, free from each other and extending to the apex of the cavity.
  Bracts entire or minutely ciliate. Anther-cells dorsally affixed to a small connective. Staminodia penicillate. Eastern or tropical species.
    Leaf-tufts on a perennial stock, with rigid sheathing bases. Staminodia densely penicillate . . . . 1. *X. complanata.*
    Leaf-tufts annual. Leaves grass-like. Staminodia very slender, with few hairs or scarcely any . . 2. *X. pauciflora.*

Bracts with black jagged margins. Anther-cells adnate the greater part of their length. No staminodia. Western species.
Flower-heads globular. Bracts very broad . . . . 3. *X. lacera.*
Flower-heads ovoid or oblong. Bracts ovate . . . . 4. *X. flexifolia.*
Placentas very short and confluent at the base of the ovary. Other characters of *X. operculata*, but bracteoles not winged . . . . 5. *X. gracilis.*
Placentas connate at the base of the ovary, extending also up the sides. Capsule usually hardened at the apex.
Staminodia densely penicillate. Bracteoles with a prominent or winged usually ciliate keel.
Bracts broad, glabrous, appressed, entire or the inner ones jagged. Eastern species . . . . 6. *X. operculata.*
Bracts ovate-oblong, hirsute or plumose at the end. Western species . . . . 7. *X. lanata.*
Bracts ovate-oblong, loosely imbricate or spreading, glabrous. Western species . . . . 8. *X. laxiflora.*
Staminodia small, transversely dilated at the end, without hairs. Bracts broad, entire. Western species . . 9. *X. gracillima.*

X. *altissima*, Lodd. Bot. Cab. t. 1900, by a horticultural error supposed to be Australian, is evidently *Bobartia spathacea*, Sweet, from South Africa.

1. **X. complanata,** *R. Br. Prod.* 256.—Stock perennial. Leaves tufted, generally surrounded by a few old brown sheaths, grass-like, flat, often very narrow, varying from 1 or 2 to above 3 in. long. Scape more or less flattened, from under 1 ft. to about 1½ ft. high. Flower-head at first short and ovoid, but sometimes lengthening into a cylindrical spike of ½ to 1 in., the scales broad, light-brown, entire or the inner ones slightly ciliate, the lower empty ones very few. Bracteoles prominently keeled or with a narrow dorsal shortly ciliate wing. Inner perianth-segments broad but small. Anther-cells quite distinct, dorsally attached to a small connective; staminodia densely penicillate. Style divided nearly to the base. Placentas of the ovary free from each other and extending to the apex of the cavity. Seeds very numerous and small.—*X. lævis* and *X. scabra*, R. Br. Prod. 256; *X. elongata*, Rudge in Trans. Linn. Soc. x. 289, t. 15; F. Muell. Fragm. viii. 205.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Bathurst Island, *A. Cunningham*; Sea Range and Victoria River, *F. Mueller*; Port Darwin, *Schultz*, *n.* 128.

Queensland. Facing Island (*X. lævis*), *R. Brown*; Moreton Bay, *F. Mueller* and others; Rockhampton, *O'Shanesy*; Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan.*

N. S. Wales. Port Jackson (*X. scabra*), *R. Brown*, *Woolls*, and others; Hastings River and Mount Mitchell, *Beckler.*

The species is also in East India if *X. Walkeri*, Wight in Kunth, Enum. iv. 19, be really identical, as it appears to be.

Var. *bracteata.* Outer scales of the flower-head enlarged into spreading bracts of 3 to 4 lines.—Moreton Bay, *Leichhardt.*

Var. ? *leptocaulis.* Scapes very narrow, scarcely compressed or angular-terete. Flower-heads small and short. Flowers not examined.—Cape York, *M'Gillivray*; Upper Brisbane River and Providence Hill, *F. Mueller.*

2. **X. pauciflora,** *Willd. Phytogr.* i. 2, t. 1.—Apparently annual. Leaves in radical tufts, grass-like, narrow, rarely above 6 in. long.

Scapes sometimes only 2 or 3 in. high, but varying from that to 1 ft. or rather more, terete or slightly flattened. Flower-head ovoid-globose, attaining 4 to 5 lines diameter when full-grown but often very much smaller, the scales very broad, entire, brown with very thin almost hyaline margins. Bracteoles thin and light-coloured, quite glabrous, without prominent keels. Perianth small for the genus. Anthers almost sessile, the cells quite distinct dorsally attached to a small connective; staminodia very slender, with very few terminal hairs and often very difficult to find. Capsule obovoid, the placentas adnate to the apex of the valves.—Kunth, Enum. iv. 17; *X. pauciflora*, *X. paludosa*, *X. denticulata*, and *X. pusilla*, R. Br. Prod. 256; *X. oligantha*, Steud. Syn. Glum. ii. 288.

N. Australia. M'Adam Range and Victoria River, *F. Mueller*; Port Essington, *Armstrong.*

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; between Norman and Gilbert Rivers, *Gulliver.*

The species is also widely spread over tropical Asia. Brown's four species were all described from Banks and Solander's Endeavour River specimens, and appear to me to differ only in size and luxuriance: the two smallest slender forms, 2 to 3 in. high with very small heads (*X. paludosa* and *pusilla*), gathered in the same locality by Cunningham, represent well Willdenow's figure; the larger forms are, however, more frequent in Indian as well as in Australian collections.

3. **X. lacera,** *R. Br. Prod.* 257.—Stems rather stout, terete, varying from under 1 ft. to above 2 ft. high, surrounded at the base by a few long, broad, loose, brown leaf-sheaths, of which 1, 2, or 3 are produced into blades of 2 or 3 in. Flower-heads ovoid or globular, under ½ in. diameter. Scales very broad, their black margins much jagged, the centre usually paler coloured. Bracteoles with an obtuse keel slightly prominent and minutely scabrous. Inner perianth-segments ovate. Anthers oblong, rather large. Staminodia none in any of the flowers examined. Placentæ of the ovary free from each other and adnate to the apex of the cavity. Style long, with very short branches dilated into fan-shaped stigmas. Capsule hardened and scarcely dehiscent at the apex, opening laterally. Seeds pale-coloured, striate.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond, n.* 200, 354, *Oldfield*, *F. Mueller.*

X. teretifolia, R. Br. l. c. from Lucky Bay, appears to be the same species with rather smaller heads.

4. **X. flexifolia,** *R. Br. Prod.* 256.—Stems very slender, twisted, usually 1 ft. high or rather more, with a single long brown sheath at the base and sometimes a second sheath produced into a slender terete twisted leaf resembling the stem. Flower-head oblong or narrow-ovoid, 3 to 4 lines long. Scales ovate, glabrous, the black margins jagged, the centre of the flowering ones pale-coloured. Bracteoles narrow, obtuse, and obtusely keeled. Outer perianth-segment more petal-like than in most species; inner segments ovate-oblong, much narrower than usual. Anthers linear-oblong, the cells almost entirely adnate; no staminodia in

the flowers examined. Ovary narrow, the placentas free from each other and adnate to the apex of the cavity. Style rather long, with short branches and entire fan-shaped stigmas. Ovules few and narrow. Capsule not seen ripe.—*X. æmula*, Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond, n.* 254, *partly*, *Preiss, n.* 2221.

5. **X. gracilis,** *R. Br. Prod.* 256.—Very similar to the narrow-headed specimens of *X. operculata*, and not always easy to distinguish from them. Leaves usually shorter, flatter, and more twisted, sometimes nearly 1 line broad, but in some varieties as narrow as in that species. Flower-heads ovoid-oblong, the scales black and entire. Bracteoles smooth and shining, entire, without dorsal wings. Inner perianth-segments very broad, but rather smaller than in *X. operculata*. Ovary partially 3-celled, the placentas confluent at the base, with linear erect ovules, and not extending much up the sides of the cavity.—Hook. f. Fl. Tasm. ii. 69; *X. juncea*, R. Br. Prod. 256.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains (*X. juncea*), *R. Brown*, *Woolls*, and others; New England, *C. Stuart*, *C. Moore*; Hastings River, *Beckler*.

Victoria. Port Phillip, *R. Brown* (*X. gracilis*); Glenelg River, *Robertson*; Dandenong Ranges, *F. Mueller*; Curdie's Inlet, *Walker*.

Tasmania. Common in various places in similar localities to *X. operculata*, *Gunn* and others.

Var. *bracteata*. Flower-heads broader, the outer scales enlarged into spreading bracts, bracteoles broader than in the common form, with slightly prominent and minutely ciliate dorsal keels, but the ovary rather of *X. gracilis* than of *X. operculata*.—South Port, Tasmania, *C. Stuart*; between Circular Head and Arthur River, *F. Mueller*.

6. **X. operculata,** *Labill. Pl. Nov. Holl.* i. 14, t. 10.—Stock perennial, with persistent tufts of distichous shining brown leaf-sheaths, some of them produced into very narrow almost subulate leaves, mostly under 6 in. long. Scapes slender, 1 to 1½ ft. high, enclosed at the base in a rather long sheath without any lamina in the centre of the tuft of leaves. Flower-head from ovoid to globular, attaining sometimes 4 to 6 lines diameter, but often much smaller, the scales black, broad and rounded, entire or the inner ones denticulate or fringed at the end. Bracteoles opaque with scarious margins, the prominent keel usually ciliate or fringed at the end. Inner perianth-segments very broadly obovate, 4 to 6 lines diameter. Anthers deeply lobed at the base and shortly so at the upper end. Staminodia filiform, with a dense tuft of jointed hairs. Style rather long, the terminal stigmas variously dilated. Placentas of the ovary more or less cohering in the axis, and continued to the apex of the cavity, though sometimes at length detached from the sides. Capsule obovoid, the hardened apex usually falling off entire, the lower part only splitting into valves.—R. Br. Prod. 257; Hook. f. Fl. Tasm. ii. 69; Bot. Mag. t. 1158; Lodd. Bot. Cab. t. 205.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. and R. Cunningham*, and many others: Hastings River, *Beckler*; New England, *C. Stuart*.

Victoria. Mount Eversley, *Robertson*; Mount Abrupt, *Wilhelmi*; Curdie's River, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown*; common in wet heaths and peat soils, *J. D. Hooker.*

S. Australia. Encounter Bay, *C. Stuart.*

The species varies much in stature, in the size of the heads, and in the scales of the flower-heads, either distinctly superposed in five rows or more or less irregularly imbricate, the outer empty ones few or numerous, and the flowering ones almost all quite entire or more or less jagged or fringed.

Var. *macrocephala.* Stems above 2 ft. high. Flower-heads ½ in. diameter, the scales almost all fringed.—Blue Mountains, *A. and R. Cunningham, Woolls.*

Var. *bracteata.* A few of the outer empty scales of the flower-head enlarged and spreading.—*X. bracteata,* R. Br. Prod. 256.—Port Jackson, *R. Brown.*

7. **X. lanata,** *R. Br. Prod.* 257.—Stock perennial. Leaves few in the tufts, almost distichous, 1 or 2 of them from 6 in. to 1 ft. long, above 1 line broad near the base, but tapering to a long fine point. Scapes often 2 or even 3 ft. long, not flattened. Flower-head ovoid, about ½ in. long, the scales oblong-spathulate, usually superposed in 5 distinct rows, hirsute outside or almost plumose at the end, the outer ones often woolly-villous to the base. Bracteoles with winged keels, ciliate at the end, and the outer perianth-segment often tubercular-hirsute at the end. Staminodia filiform, with a dense tuft of jointed hairs. Stigmas much dilated. Capsule with a hardened apex as in *X. operculata.* Placentas slightly connate at the base, extending up the sides of the cavity but not into the hardened apex. Ovules and seeds ascending from the lower part of the cavity almost as in *X. gracilis.*—Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound and adjoining districts, *R. Brown, Fraser, A. Cunningham, Drummond, n.* 201, 354, *Preiss, n.* 2222, and others.

8. **X. laxiflora,** *F. Muell. Fragm.* viii. 203.—Apparently annual. Leaves tufted, flat, narrow, the inner ones 4 to 6 in. long, the outer shorter. Scapes rather slender, 1 to 2 ft. high. Flower-head ovoid, about ½ in. long, the scales broad, quite entire, dark or black with a pale centre, less closely imbricate than in the other species, and the outer one often spreading. Bracteoles with a prominent almost winged keel, shortly ciliate or denticulate. Inner perianth-segments broad but not large. Anthers short; staminodia with a dense tuft of hairs. Ovary pubescent and shortly 3-lobed at the apex; placentas united at the base and adnate upwards, but not extending to the apex; stigmas slightly dilated and minutely fringed. Ovules few, erect. Capsule hardened at the apex but not seen ripe.

W. Australia. *Drummond, n.* 202.

9. **X. gracillima,** *F. Muell. Fragm.* viii. 203.—Stems or scapes as in *X. flexifolia* slender, almost filiform, with brown sheaths at their base rarely produced into leaves, but more tufted than in that species, and mostly above 1 ft. high. Flower-head ovoid or obovoid, 3 to 4 lines long, quite glabrous, the scales broad, with black margins quite entire

and paler centres. Bracteoles obtuse and obtusely keeled, quite glabrous. Inner perianth-segments ovate. Anther linear, oblong, scarcely lobed at the base, with very short filaments; staminodia ending in a transverse dilatation without any hairs. Ovary narrow, hirsute and 3-lobed at the top; placentas connate at the base with few long ovules. Style slender, with 3 filiform branches and very small capitate stigmas.

W. Australia, *Drummond, n.* 199.

ORDER CXXXI. COMMELYNACEÆ.

Flowers hermaphrodite or rarely polygamous, usually slightly irregular. Perianth of 6 segments, free or rarely united at the base, more distinctly representing a calyx and corolla than in any other syncarpous Monocotyledons, 3 outer ones thin and membranous or herbaceous, much imbricate, the outermost often smaller, 3 inner very delicate and petal-like, spreading, one often rather different in shape or size from the others. Stamens 6 or fewer by abortion, attached to the base of the segments or almost hypogynous; anthers when perfect 2-celled, the cells opening laterally or inwards in longitudinal slits or rarely in terminal pores; staminodia when substituted for stamens all on one side of the flower, not alternating with the perfect stamens. Ovary 3-celled or rarely 2-celled, with 1, 2 or more orthotropous ovules in each cell, laterally attached to the inner angle and when several superposed in 1 or 2 rows. Style simple, with a terminal entire or 3-lobed stigma. Fruit a capsule or rarely indehiscent though dry. Seeds thick, peltate or angular, the testa often wrinkled or reticulate. Embryo small, partly sunk in the side of the fleshy albumen remote from the hilum, and usually covered by a small deciduous operculum.—Herbs erect or more frequently weak and creeping at the base, rarely in species not Australian twiners, or tall and almost shrubby. Leaves parallel-veined, with sheathing bases. Flowers usually blue, purple, or white, in panicles, umbels, or clusters, either terminal or issuing from the leaf-sheaths on the side of the stem opposed to the leaf.

The order is chiefly tropical or subtropical, and is common to the New and the Old World. Of the six Australian genera, three are spread over both hemispheres, one is limited to the Old World, one to the Indo-Australian region, and one only is endemic in Australia.

Flowers enclosed in a folded, cordate-turbinate or falcate spatha or leafy bract, or within short loose leaf-sheaths.
  Perianth-segments united in 2 series. Stamens all perfect. 1. CYANOTIS.
  Perianth-segments free. Half the stamens reduced to staminodia . . . . 2. COMMELYNA.
No spatha. Bracts small. Flowers paniculate.
  Half the stamens reduced to staminodia. Ovary and capsule 3-celled . . . . 3. ANEILEMA.

Stamens all perfect. Ovary and capsules 2-celled . . . 4. Floscopa.
Stamens all perfect or half reduced to staminodia. Fruit globular, indehiscent, usually blue . . . . 5. Pollia.
No spatha. Flowers spicate. Outer segments herbaceous.
Stamens all perfect. Ovary 3-celled . . . . 6. Cartonema.

1. CYANOTIS, Don.

(Zygomenes, *Salisb.*, name only).

Flowers regular. Outer perianth-segments more or less united in a 3-lobed calyx, inner segments more or less united in a tube at the base with 3 spreading lobes. Stamens 6, inserted on the inner segments; filaments bearded towards the top; anthers all perfect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 superposed ovules in each cell. Capsule 3-valved. Seeds laterally attached, one at the lower angle, the other at the upper angle.—Creeping or ascending herbs. Flowers in short dense spikes or clusters, in a complicate falcate leafy bract or spatha, or within loose leaf-sheaths.

The genus is dispersed over the tropical regions of Asia and Africa, the only Australian species is a common Indian one from Ceylon and the Peninsula to the Malayan Archipelago and South China.

1. **C. axillaris,** *Rœm. and Schult.; Kunth, Enum.* iv. 105.—A glabrous annual, with long creeping or shortly ascending branches. Leaves linear or linear-lanceolate, 2 to 4 in. long. Flowers 2 or 3 together within the short loose leaf-sheaths. Outer perianth-segments nearly 3 lines long, shortly united at the base; inner perianth deep blue, the tube slender, cylindrical, longer than the outer segments. Filaments thickened above a dense tuft of jointed hairs.—*Tradescantia axillaris*, Roxb. Corom. Pl. t. 107; *Zygomenes axillaris*, Salisb. in Trans. Hort. Soc. i. 271; F. Muell. Fragm. viii. 62; *Cyanotis axillaris*, Clarke, Comm. et Cyrt. Beng. t. 35 (copied from Roxburgh).

N. Australia. Sturts' Creek, *F. Mueller.*
Queensland. Elliott and Burdekin Rivers, *Bowman.*

The species is a common Indian one. Salisbury, in giving to it the name of *Zygomenes*, gave no indication of the extent or character he proposed to assign to it as a genus; it cannot therefore be taken as such a publication as necessarily to supersede the universally adopted name *Cyanotis.*

2. COMMELYNA, Linn.

Perianth-segments all free, 2 of the outer ones larger than the third outermost, and one of the inner frequently differently shaped or more sessile than the two others. Perfect stamens usually 3, the central one with a larger anther than the two others; staminodia 3 or rarely 2, with deformed anthers. Ovary 3-celled or rarely 2-celled; ovules in each of 2 cells 2 superposed, 1 only in the third smaller cell, or ovules 1 in each of 3 cells, or the 3rd cell entirely wanting. Style filiform,

with a small stigma. Capsule usually 3-celled, the 2 biovulate cells opening loculicidally, the 3rd uniovulate cell remaining long closed at the back of one of the valves, but sometimes all 3 cells open loculicidally or the 3rd cell is deficient. Seeds smooth or pitted, rugose or reticulate.—Weak herbs, often creeping at the base. Flowers in a complicate oblique leafy bract or spatha, usually 2 or more on a peduncle included in the spatha, with a second peduncle in the same spatha articulate halfway up and bearing a single usually male flower, or reduced to a short barren bristle. Fruiting pedicels recurved so as to ripen the capsule within the spatha.

The genus is widely spread over the warmer regions of both hemispheres, supplying several common weeds of cultivation. The three Australian species may be all endemic, they are very near corresponding Asiatic species to which they have been sometimes referred, but I have been unable to match them precisely.

Spatha not cordate, closed at the base, forming an oblique turbinate inverted cone open at the top only . . . . 1. *C. ensifolia.*
Spatha cordate at the base, with rounded auricles closely appressed but not connate.
  Leaves ovate-lanceolate or rarely narrow, contracted above the sheath. Spatha acute, rarely acuminate. Seeds pitted. . . . . 2. *C. cyanea.*
  Leaves very narrow, not contracted above the sheath. Spatha with a long point. Seeds smooth or slightly rugose . . . . 3. *C. lanceolata.*

1. **C. ensifolia,** *R. Br. Prod.* 269.—Glabrous or with a slight pubescence on the leaf-sheaths and a few cilia at the base of the leaves, or rarely a more copious pubescence chiefly on the leaves and spathas. Stems weak, from a procumbent or creeping base ascending to 1 ft. or rather more. Leaves lanceolate, acuminate, mostly 3 to 4 in. long, very narrow or almost linear or rarely more than ½ in. broad, shortly contracted at the base above the membranous often scarious sheath. Spathas usually solitary, sessile or shortly pedunculate, opposite the last leaves, cucullate, very broadly falcate but scarcely acuminate, ¾ to 1 in. long, the closed base 4 to 6 lines long. Each spatha, besides a small rudimentary pedicel, contains a single peduncle shorter than the spatha, bearing 1 to 5 or rarely 6 flowers on pedicels which bear them beyond the spatha, but are recurved within it immediately after flowering. Outer perianth-segments unequal, the largest 3 lines long; inner ones about twice as long, blue, one rather smaller than the other. Stamens 3 perfect, 1 anther larger than the 2 others. Ovary 2- or 3-celled with 1 ovule in each cell. Capsule with 2 dehiscent cells, the 3rd sometimes small, barren, or deficient, sometimes ripening the seed and then dehiscent. Seeds smooth.—F. Muell. Fragm. viii. 60; *C. undulata,* R. Br. Prod. 270.

N. Australia. Islands of the gulf of Carpentaria, *R. Brown, Henne,* and others; Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 70, 161; Upper Victoria River, *F. Mueller,* Camden Harbour, *Walter;* Central Australia, *M'Dougal Stuart's and Gosse's Expeditions.*

Queensland. From the Maranoa, *Mitchell*, and Peak Downs, *F. Mueller*, over the whole tropical part of the colony to Cape York, *numerous collectors.*
N. S. Wales. Between the Darling and Cooper's Creek, *Neilson.*

Some of the Queensland specimens have broader leaves and 2 spathas at the ends of the stems, but opposed to distinct leaves, and not clustered as they usually are in *C. obliqua*, Don, which is the only Indian species which this one otherwise resembles.

2. **C. cyanea,** *R. Br. Prod.* 269. — Glabrous. Stems weak, creeping and rooting at the base, ascending to 1 or 2 ft. Leaves ovate-lanceolate to narrow-lanceolate, acuminate, mostly 1½ to 3 in. long, very shortly contracted at the base above the sheath. Spathas on short peduncles opposed to the upper leaves, broad, shortly acuminate, deeply cordate at the base with rounded auricles not connate, mostly ¾ to 1 in. long. Peduncles 2, shorter than the spathe below the articulation, but the pedicels protruding beyond it, one peduncle with a single male flower or without any, the others with 2 or rarely 3 flowers on short pedicels. Outer perianth-segments under 3 lines, the inner twice that diameter, those of each series nearly equal. Three perfect anthers, the larger one sagittate, 2 or 3 staminodia. Ovary with 2 ovules in each of 2 cells, 1 only in the third. Capsule with the 2-seeded cells dehiscent, the third usually indehiscent. Seeds without the raised reticulations of *C. communis*, but more or less marked with small scattered pits.—*C. communis*, F. Muell. Fragm. viii. 59, but not exactly the common Asiatic and African *C. communis*, Linn.

N. Australia. Victoria River, *F. Mueller.*
Queensland. Brisbane River, Moreton Bay, *F. Mueller*; Warwick, *Beckler*; Springsure, *Wuth.*; Rockhampton, *Dallachy*, *O'Shanesy*, and others; Rockingham Bay, *Dallachy*, Cape York, *Veitch.*
N. S. Wales. Hunter's River, *R. Brown*, *Oldfield*; Clarence, Hastings, and Macleay Rivers, *Beckler.*

3. **C. lanceolata,** *R. Br. Prod.* 269.—Resembles the slender narrow-leaved forms of *C. cyanea*, but the leaves appear to be always narrow-linear or linear-lanceolate, and the upper ones at least gradually enlarged at the base into a very short sheath without any contraction above it. Spathas narrow and usually produced into a long point, cordate at the base with free rounded auricles. Flowers like those of *C. cyanea*, but one of the outer segments decidedly smaller and narrower than the others, the inner ones nearly equal. Larger anther sagittate, with shorter diverging auricles. Capsules ripening 1 or 2 seeds in each of 2 cells, the 3rd cell remaining small and empty. Seeds smooth or coarsely wrinkled, without the raised reticulations of *C. communis*, or the pitted surface of *C. cyanea*.—*C. agrostophylla*, F. Muell. Fragm. viii. 59.

N. Australia. Sturt's Creek, Albert and Roper Rivers, *F. Mueller.*
Queensland. Bustard Bay, *Banks and Solander*, Port Curtis and Fitzroy Island, *M'Gillivray.* The seeds of these Queensland specimens are rather more rugose than the north-western ones, though otherwise very much like. The character, however,

in all the species of *Commelyna* as derived from the markings of the seed must be taken with great caution, as they can be observed in very few specimens only, and may not be so constant as they have been supposed to be.

3. ANEILEMA, R. Br.

(Aphylax, *Salisb.*, name only.)

Perianth-segments all free, 3 outer ones membranous, concave, slightly imbricate, 3 inner petal-like, obovate, nearly equal. Perfect stamens 3 or sometimes only 2, on one side of the flower; anthers ovate or oblong, the cells opening in longitudinal slits; staminodia 3 or 4 or only 2, with variously shaped imperfect anthers. Ovary 3-celled or rarely 2-celled, with 1 to 5 ovules in each cell superposed in 1 or 2 rows; style subulate, with a small stigma. Capsule oblong ovoid or nearly globular, opening in 3 or rarely 2 valves. Seeds 1 or more in each cell, superposed in a single row, almost cubical, usually rugose.—Weak herbs, with ascending or erect stems. Flowers small, in a loose terminal panicle, singly pedicellate along the branches within a small concave bract, or 2 together within the terminal bract.

The genus is widely spread over the tropical regions of both hemispheres, but more abundant in the Old World than in the New. Of the six Australian species one is widely spread over tropical Asia and eastern Africa, the others as far as hitherto known are endemic.

Filaments all glabrous. Ovary with only 2 perfect cells.
  Stems weak; ascending.
    Leaves ovate-lanceolate. Ovules 3 or 4 in each cell.
      Panicle slender, thyrsoid, usually pedunculate. Capsule oblong . . . . 1. *A. acuminatum.*
      Inflorescence sessile, of 2 short 2-flowered branches. Ovary with a third imperfect cell . . . . 2. *A. biflorum.*
    Leaves lanceolate. Ovules 2 in each cell. Capsule as broad as long . . . . 3. *A. sclerocarpum.*
    Leaves linear or narrow-lanceolate. Ovules 1 in each cell. Panicle long and slender. Flowers small . . . . 4. *A. siliculosum.*
Filaments all or some of them bearded. Ovary 3-celled.
  Stems erect. Radical leaves linear, tufted.
    Filaments all bearded. Panicle irregular, the pedicels distant along the branches . . . . 5. *A. gramineum.*
    Filaments of the perfect stamens bearded, of the staminodia glabrous. Pedicels close together along the branches, leaving a thickened denticulate rhachis . 6. *A. giganteum.*

1. **A. acuminatum,** *R. Br. Prod.* 270.—Stems from a creeping base ascending to 1 ft. or rather more, including the panicle, the whole plant glabrous except minute raised dots, giving a roughness to the leaves and rhachis of the panicle. Leaves ovate-lanceolate, acute, 1½ to 3 in. long, mostly shortly petiolate above the sheath, the upper ones either crowded together or all distant. Panicle slender, thyrsoid, often 3 to 6 in. long or even more, usually pedunculate above the last leaves, or rarely with smaller leaves close under it; branches simple, filiform, singly or rarely in pairs along the rhachis, the bracts under the branches very small and lanceolate. Pedicels filiform, 2 to 4 lines long,

singly scattered along the branches within broad cucullate bracts under ½ line long, or 2 together within the uppermost bracts. Outer perianth-segments oblong, 1½ lines long, inner ones twice as long, almost orbicular. Filaments all glabrous, 2 or rarely 3 with perfect anthers, 1, 2 or rarely 3 with abortive anthers. Ovary 2-celled, with 3 or 4 (sometimes 5 ?) ovules in each cell. Capsule oblong, very obtuse, much flattened, longer than the perianth. Seeds irregularly tuberculate-rugose.—*A. laxum*, R. Br. Prod. 270; *A. siliculosum*, F. Muell. Fragm. viii. 61, not of R. Br.

Queensland. Endeavour River and Bustard Bay, *Banks and Solander;* Moreton Bay, *F. Mueller*, *Backhouse* and others; Rockhampton, *O'Shanesy*, *Bowman*, and others; Rockingham Bay, *Dallachy*.

N. S. Wales. Grose River, *R. Brown;* Macleay and Hastings Rivers, *Beckler;* Tweed River, *C. Moore;* New England, *C. Stuart.*

2. **A. biflorum,** *R. Br. Prod.* 270.—Stems very slender, creeping and loosely branched at the base, the flowering branches ascending to 6 or 8 in. Leaves ovate-lanceolate, acute, distinctly petiolate above the sheath, mostly 1 to 1½ in. long. Inflorescence sessile within the last leaf and rarely exceeding it, consisting usually of 2 short branches, each bearing 2 flowers within a small cucullate bract, without any bracts below it. Flowers rather smaller than in *A. acuminatum*. Perianth of that species. Filaments all glabrous, 3 with rather large anthers, 3 much shorter with small imperfect anthers. Ovary with 2 perfect cells containing usually 3 superposed ovules in each and a third smaller cell without perfect ovules. Capsule only seen unripe, not so flat as in *A. acuminatum.*

Queensland. Brisbane River, *Bailey.*

N. S. Wales, *R. Brown;* New England, *C. Stuart.*

3. **A. sclerocarpum,** *F. Muell. Fragm.* viii. 61.—Stems weak, branching, ascending to about 1 ft., with the minute scabrous dotting of *A. acuminatum*. Leaves lanceolate, acute, tapering into a short petiole above the sheath, mostly 1½ to 2 in. long. Panicle short, but loose and slender, sessile above the last leaf, with few rather long filiform branches, each bearing several flowers on filiform pedicels of 2 to 4 lines, solitary and distant along the branches but always 2 together within the last bract. Bracts very small and scarious except sometimes under the lowest 1 or 2 branches. Outer perianth-segments ovate, obtuse, about 1½ lines long, inner ones longer. Filaments all glabrous, 3 with perfect anthers, 3 with abortive ones. Ovary 2-celled with 2 superposed ovules in each cell and no rudiment of the third cell. Capsule as broad as long and rather shorter than the perianth, the pericarp rather more rigid and darker coloured than in *A. acuminatum.* Seeds tuberculate-rugose.

Queensland. Herbert's Creek, *Bowman.*

4. **A. siliculosum,** *R. Prod.* 270.—Quite smooth and glabrous

except a slight pubescence on the rhachis of the inflorescence. Stem weak, branched and leafy, probably tall or long but the lower part unknown. Leaves broadly linear or almost lanceolate, broad and stem-clasping at the base but scarcely forming a distinct sheath, except perhaps the lower ones, tapering to a point, the largest in our specimens 6 to 7 in. long and 4 to 6 lines broad below the middle. Panicle slender, thyrsoid and at length 6 in. long or even more as in *A. acuminatum*, but the flowers much smaller, the branches filiform with 2 or 3 flowers in each on filiform pedicels. Bracts very small. Outer perianth-segments 1 to 1¼ lines long, the inner scarcely 2 lines. Filaments all glabrous, 3 with perfect anthers, 3 with small abortive ones. Ovary 2-celled, with 1 ovule in each cell. Capsule very obtuse, rather longer than the perianth. Seeds 1 in each cell, oblong, transversely rugose.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Cape York, *M'Gillivray.*

The above description was taken from M'Gillivray's very good specimens, in R. Brown's the branches of the panicle are longer with a few empty bracts below those subtending the pedicels. I could not verify the internal structure of the ovary, but to all appearance it was as in M'Gillivray's. The species is evidently quite distinct from *A. acuminatum.*

5. **A. gramineum,** *R. Br. Prod.* 270.—Rarely quite glabrous, usually with a scabrous pubescence at least on the leaf-sheaths and some long hairs or cilia on the margins of the sheaths and base of the leaves. Fibrous roots often much thickened, almost tuberous. Radical leaves tufted, grass-like, with short broad sheaths, mostly 3 or 4 in. long, but in very luxuriant specimens at least twice that length, varying from 3 or 4 lines broad and tapering to a long point to very narrow almost subulate. Stems erect, 6 in. to nearly 2 ft. high, with few long leaves dilated into short sheaths. Panicle very irregularly and loosely branched, rarely much longer than broad, often forked at the base but the branches otherwise simple, long or short, on a flexuose rhachis, the pedicels rather distant along the branches with a scarious bract under each. Outer perianth-segments varying from under 3 lines to nearly 4 lines, the inner ones longer, usually pale blue and much veined, but in some specimens appearing of a different colour without conspicuous veins. Filaments all bearded, 3 with perfect anthers, 3 with small abortive ones. Ovary 3-celled, with 4 or 5 ovules in each cell. Capsule oblong or ovoid, rather longer than the perianth. Seeds pitted-rugose.—F. Muell. Fragm. viii. 62.

N. Australia. North coast and islands of the Gulf of Carpentaria, *R. Brown;* Victoria River and Sea Range, *F. Mueller;* Port Darwin, *Schultz, n.* 88.

Queensland. Broad Sound, *R. Brown;* Brisbane River, Moreton Bay, *A. Cunningham, F. Mueller,* and others; Peak Downs and Mackenzie River, *F. Mueller;* Rockhampton, *Bowman, O'Shanesy,* and others; Port Curtis, *M'Gillivray;* Keppel Bay, *Thozet;* Rockingham Bay, *Dalachy.*

N. S. Wales. Hunter's River. *R. Brown;* Clarence River, *Beckler;* Richmond River, *Woolls;* New England, *C. Stuart, C. Moore.*

Most of the N. S. Wales specimens and a few of the Queensland ones have broader leaves and larger flowers than Brown's typical ones from Hunter's River and Broad Sound. Brown's *A. affine* (Prod. 271) from the north coast is a variety with narrow leaves, slender panicles, and the capsule 4 to 5 lines long. *A. anthericoides*, Br. l. c. 271, from the islands of the Gulf of Carpentaria, is intermediate between that and the typical form.

6. **A. giganteum,** *R. Br. Prod.* 271.—Quite glabrous. Fibrous roots much thickened, almost tuberous. Radical leaves tufted, linear or linear-lanceolate, with short broad sheaths, 6 in. to 1 ft. long or even more, tapering to a fine point. Stems erect from amongst or by the side of the leaf-tufts, 1 to 2 ft. high or more in some Indian specimens, with few shorter leaves dilated into rather long sheaths, the uppermost under the first branch of the inflorescence reduced to a sheathing bract. Panicle simple or forked at the base, each branch bearing 2 to 6 unilateral racemes scorpioid when young, the lowest on a long peduncle the uppermost almost sessile on the common rhachis. Pedicels close above one another, the bracts reduced to a small tooth, leaving in the old racemes a thickened closely denticulate rhachis. Outer perianth-segments thin and somewhat coloured, 3 lines long or rather more, inner ones larger, of a deep blue. Perfect stamens 3 with bearded filaments and rather large anthers; staminodes 3 with shorter glabrous filaments. Ovary 3-celled, with 2 ovules in each cell. Capsule acute or acuminate, rarely almost obtuse, about as long as the perianth. Seeds finely and not deeply sculptured. — *Commelyna gigantea*, Vahl, Enum. ii. 177; *Aneilema longifolia*, Hook. Exot. Fl. t. 204; *A. ensifolium* and *A. secundum*, Wight, Ic. t. 2074, 2075; *A. nudiflorum*, F. Muell. Fragm. viii. 62, not of R. Br.

N. Australia. Islands off the N. coast, *R. Brown;* Port Darwin, *Schultz*, n. 642.

Queensland. Cape York, *Veitch;* Cape York Peninsula, *Hann's Expedition.*

Var. *gracilis*, very slender, with smaller and fewer flowers.

Queensland. Rockingham Bay, common in long grass, *Dallachy.*

The species appears to be widely spread in East India from Ceylon and the Peninsula to the Malayan Archipelago and in E. tropical Africa. It is easily recognised by the closely denticulate rhachis of the racemes, well indicated by Vahl but omitted by Kunth in his transcription of Vahl's diagnosis. *A. nudiflorum*, R. Br., has a nearly similar rhachis but much smaller flowers with some other differences. The flowers in *A. giganteum* are variable, largest in a few Indian specimens, rather smaller in the African and Australian ones, especially in the above-mentioned var. *gracilis*. In Wight's figure of *A. ensifolium*, the staminodia are represented with bearded filaments as well as the perfect stamens, but that is evidently an error of the artist, who has also in all the *Aneilemas* figured the staminodia as alternating with the perfect stamens instead of each being collected on one side.

4. FLOSCOPA, Lour.

(Dithyrocarpus, *Kunth.*)

Perianth-segments all free, 3 outer ones membranous, concave, imbricate, 3 inner large, petal-like, one rather narrower than the others, Stamens 6, all perfect; anther-cells opening in longitudinal slits.

Ovary contracted at the base or shortly stipitate, 2-celled with 1 ovule in each cell; style subulate, with a small terminal stigma. Capsule shortly stipitate, compressed, didymous, opening in 2 valves. Seeds solitary in each cell, laterally attached.—Erect or ascending herbs, usually creeping at the base. Flowers small, pedicellate and racemose along the branches of a dense terminal panicle.

The genus is extensively dispersed over the tropical regions of the New as well as the Old World, and consists of but very few species, the majority of those published being reducible to the single Australian one which extends over the whole area of the genus.

1. **F. paniculata,** *Hassk. Pl. Jungh.* 151.—Stems ascending to 1 or 2 ft., usually glabrous. Leaves lanceolate or ovate-lanceolate, acuminate, 2 to 4 in. long, scabrous on the upper side, the sheath fringed with long hairs, at least at the top. Flowers small, in a dense terminal ovate or broad hirsute panicle, $1\frac{1}{2}$ to 2 in. long, sometimes leafy at the base, the branches simple or the lower ones forked. Outer perianth-segments very hairy, 1 line long or rather more, inner ones but little longer, bright blue. Stamens exserted.—*Tradescantia paniculata*, Roxb. Corom. Pl. t. 109; also the several *Dithyrocarpi* figured by Wight, Ic. t. 2079 and 2080, or described by Kunth, Enum. iv. 78 and 79, and other synonyms, quoted in Benth. Fl. Hongk. 377.

Queensland. Rockingham Bay, common, *Dallachy*; Daintree River, *Fitzalan*. Widely diffused over tropical Asia, Africa, and Brazil.

5. POLLIA, Thunb.

(Aclisia, *E. Mey.* Lamprocarpus, *Blume.*)

Perianth-segments all free, 3 outer ones membranous, thin, very broad and much imbricate, 3 inner petal-like, obovate, nearly equal. Stamens 6, somewhat declinate, all perfect or the 3 upper ones reduced to staminodia with small empty anthers; perfect anthers ovate, emarginate at the base, the cells opening in longitudinal slits. Ovary 3-celled, with several ovules in each cell superposed in 2 rows; style subulate, with a small stigma. Fruit ovoid or globular, usually blue and shining, indehiscent but dry with a brittle pericarp. Seeds angular, with a brown testa.—Tall perennials, usually weak and creeping at the base. Leaves large. Flowers in terminal thyrsoid panicles, the primary branches often forming clusters almost whorled. Bracts all shorter than the flowers.

The genus extends over tropical and eastern subtropical Asia. Of the two Australian species one is endemic, the other reaches the Salomon Islands.

Margin of the leaf-sheaths and leaves quite entire. Branches of the oblong panicle in distinct clusters or whorls . . 1. *P. macrophylla.*
Margin of the leaf-sheaths and base of the petiole undulate-crisped. Branches of the short sessile panicle densely crowded . . . . 2. *P. crispata.*

1. **P. macrophylla,** *Benth.*—Quite glabrous. Stems creeping and rooting at the lower joints, ascending or erect to the height of several feet. Leaves broadly lanceolate, acuminate, mostly 6 to 8 in. long, tapering into a short petiole above the sheath, the margin not at all waved, the sheath loosely cylindrical, ½ to 1 in. long, the orifice oblique and quite entire, the uppermost leaf usually sessile and stem-clasping almost without any sheath. Panicle shortly pedunculate above the last leaf, oblong, 3 to 4 in. long, the branches collected in distinct clusters almost verticillate, each branch rarely above ½ in. long, bearing several flowers on short slender pedicels. Bracts lanceolate and leafy under the lowest clusters of branches, small, very broad, obtuse and thin under the pedicels. Outer perianth-segments scarcely 2 lines long, inner ones rather longer, recorded generally as blue, but in one instance said to be white. Perfect stamens 3, the 3 others reduced to staminodia. Fruit ovoid, rather narrow, usually about 3 lines long.—*Aneilema macrophyllum*, R. Br. Prod. 270.

Queensland. Northumberland Islands, *R. Brown*; Brisbane River, *F. Mueller*; Rockingham Bay, *Dallachy*; Fitzroy River, *O'Shanesy*; Port Denison, *Fitzalan*. The species is also in the Salomon Islands.

F. Muell. Fragm. v. 40, unites this and the following species under the name of *P. cyanococca*. This specific name is quite as applicable to the whole genus as Brown's original one *macrophylla*.

2. **P. crispata,** *Benth.*—A weak ascending perennial, rooting at the base. Leaves lanceolate, acuminate, 4 to 6 in. long, tapering at the base, the very short petiole and orifice of the sheaths undulate-crisped, almost denticulate, the sheath loosely cylindrical, ½ to 1 in. long; the uppermost leaves crowded and smaller. Panicle closely sessile within the last leaves, rarely 2 in. long, the crowded branches attaining at length 1 to 2 in. Flowers rather numerous, rather larger than in *P. macrophylla*. Stamens as in that species. Fruit ovoid, about 3 lines long.—*Aneilema crispata*, R.Br. Prod. 270; Bauer, Illustr. Fl. Nov. Holl. t. 6.

Queensland. Moreton Bay, *F. Mueller*, *Eaves*.
N. S. Wales. Williams River, *R. Brown*; Hastings River, *A. Cunningham*, *Beckler*; Clarence River, *Wilcox*; Richmond River, *Henderson*; New England, *C. Stuart*; and southward to Illawarra, *A. Cunningham*.

6. CARTONEMA, R. Br.

Perianth-segments all free, 3 outer ones herbaceous, lanceolate, 3 inner very broad, petal-like, sessile, withering after flowering but persistent. Stamens 6, nearly equal; anthers oblong or rarely short, opening in terminal pores at length continued into lateral slits. Ovary 3-celled, with 2 superposed ovules in each cell. Style filiform, with a small terminal pedicellate stigma. Capsule 3-valved.—Herbs with leafy stems, simple or branched at the base. Leaves narrow. Flowers in

simple terminal spikes or racemes, solitary within small or narrow bracts.

The genus is limited to Australia, the four species regarded by some botanists as varieties of a single one.

Spikes dense. Outer perianth segments 8 to 9 lines long. Filaments broad and thin. Anthers narrow, oblong	1. *C. philydroides.*
Spikes dense. Outer perianth-segments 6 to 7 lines long. Filaments narrow. Anthers narrow, oblong .	2. *C. spicatum.*
Spikes elongated the flowers all distant. Outer perianth-segments 3 to 4 lines long. Filaments shorter than the anthers	3. *C. parviflorum.*
Spikes dense. Outer perianth-segments 3 to 4 lines long. Anthers ovate, much shorter than the filaments	4. *C. brachyantherum.*

1. **C. philydroides,** *F. Muell. Fragm.* i. 62.—A tall species, much resembling Bauer's figure of *C. spicatum* in general habit. Stems very leafy, from 6 in. to above 1 ft. high, pubescent as well as the leaves which are otherwise those of *C. spicatum.* Spikes dense, 3 to 4 in. long. Outer perianth-segments lanceolate, subulate-acuminate, 8 to 9 lines long, inner segments about as long, not at all spotted. Filaments very broad, thin, and hyaline; anthers narrow-oblong, the cells opening in lateral slits to the base. Capsule rather obtuse, sprinkled with a few hairs.—*C. spicatum,* Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound to Swan River, apparently abundant, *Drummond, Preiss, n.* 2228.

2. **C. spicatum,** *R. Br. Prod.* 271, *partly.*—Stems branching at the base, usually hairy, rarely 6 in. high below the spike. Leaves linear, tapering from a base of $1\frac{1}{2}$ to 3 lines broad just above the sheath to a long point, the longer ones usually exceeding the spike. Spikes 1 to 3, sometimes very compact and only 2 in. long, rarely elongated to 6 in., and rather loose. Bracts linear-subulate, shorter than the perianth. Outer perianth-segments subulate-acuminate, 5 to 6 lines long, very hairy; inner segments obovate, nearly as long, often but not always spotted. Filaments slightly flattened, at first shorter but at length rather longer than the oblong-linear anthers, which open in terminal pores rarely splitting down the sides of the cells. Ovary and capsule glabrous.—Kunth, Enum. iv. 115; Bauer, Illustr. Fl. Nov. Holl. t. 7.

N. Australia. Arnhem S. Bay, *R. Brown;* North Goulburn Island, *A. Cunningham;* Escape Cliffs, *Hulse;* Port Darwin, *Schultz, n.* 25.

3. **C. parviflorum,** *Hassk. in Flora,* 1869, 365.—Less hairy than *C. spicatum,* and taller, chiefly from the length of the spike, the leaves very long and narrow. Spike loose from the first with the flowers all distant and often lengthening to 1 ft. or even more. Outer perianth-segments 3 to 4 lines long, inner ones usually more or less dotted.

Filaments very short, anthers oblong, the cells opening in some specimens in terminal pores only, in others the slit extending to the base. Capsule small, glabrous.

N. Australia. Islands of the north coast, *R. Brown;* Victoria River, *F. Mueller;* north-west coast, *Bynoe;* Glenelg district, *Martin;* Port Darwin, *Schultz, n.* 280; Liverpool River, *Gulliver.*

This was included by Brown in his *C. spicatum*, both forms bear in his herbarium the specific name of *villosa,* which was, however, never published.

4. **C. brachyantherum,** *Benth.*—A dwarf plant, the stems not above 1 to 2 in. high below the spike, the leaves mostly exceeding the spikes. Spikes about $1\frac{1}{2}$ in. long, dense and hairy as in *C. spicatum*, but the flowers very much smaller, like those of *C. parviflorum*, and the anthers different from those of all other species, being shorter than broad, the cells opening laterally to the base. Capsule glabrous.

Queensland. Port Denison, *Fitzalan.*

ORDER CXXXII. JUNCACEÆ.

Flowers hermaphrodite or diœcious. Perianth inferior, persistent, with or without a distinct tube, the limb or perianth of 6 lobes or segments imbricate in 2 series or the outer ones rarely valvate, all or at least the outer ones, or in diœcious species, at least the females glume-like or rigid, or scarious thin and almost hyaline, the inner ones rarely somewhat petal-like. Stamens usually 6, attached to the base of the lobes or segments or almost hypogynous, the 3 opposite the inner segments deficient in a few species; filaments free; anthers erect or versatile, with 2 parallel cells opening laterally or inwards in longitudinal slits. Ovary superior, 3-celled or if 1-celled with 3 parietal or basal placentæ, with 1 or several ovules to each cell or placenta, anatropous or amphitropous. Style either single with a small terminal stigma, or short and more or less deeply divided into 3 oblong or subulate recurved stigmatic branches. Fruit a capsule, opening loculicidally in 3 valves, or rarely owing to the splitting of the valves 6-valved. Seeds erect or laterally attached, ovoid globular angular or rarely flattened, the testa appressed, rarely black and not shining. Embryo small and basal, rarely linear and transverse, in a hard or fleshy rarely almost mealy albumen.—Perennial or rarely annual rigid herbs, with a short or tuberous or creeping rhizome, or the stock growing up into a woody caudex rarely almost arborescent. Flowering stems or scapes leafless or nearly so except at the base, or branching and leafy and then usually slender and covered by the leaf-sheaths. Leaves mostly radical narrow grass like or rigid with fine parallel veins. Flowers small (except in Calectasieæ), green brown or whitish, very rarely blue, often densely clustered with small imbricate scarious bracts, the single flowers or clusters solitary and terminal or in terminal panicles.

The two typical genera of this somewhat heterogeneous order are amongst the most generally spread, especially in extratropical and subtropical regions, the remaining genera here enumerated, forming the first three anomalous tribes, are limited to Australia with the exception of a single species found also in New Caledonia. The order comprises also a very few anomalous genera from other parts of the world not found in Australia. As a whole it is very nearly allied to *Liliaceæ*, to which some of the genera here included have been occasionally referred, according as the greatest weight has been attached to the distinctive characters derived from the perianth the seed or the habit. Each of the following tribes has been regarded by some botanists as a distinct order, or the first three have been united with a few extra-Australian genera as an intermediate Order between *Liliaceæ* and *Juncaceæ* without however any common definite distinctive character.

TRIBE I. **Xeroteæ.** *Perianth small, usually dry, scarious, or hyaline, at least in the females, rarely almost petal-like. Anthers versatile, attached at the back between the basal lobes. Ovary 3-celled, with 1 laterally attached ovule in each cell.*

Flowers diœcious. Style short with 3 recurved branches. Leaves in radical tufts or along short leafy stems, not fringed above the sheath . . . . 1. XEROTES.

Flowers hermaphrodite. Style subulate, with a small terminal stigma.

Capsule smooth. Leaves in radical tufts bordered when young by a scarious lacerated margin . . . . 2. CHAMÆXEROS.

Capsule muricate. Leaves along short leafy stems . . 3. ACANTHOCARPUS.

TRIBE II. **Xanthorrheæ.** *Outer perianth glume-like, inner thin and scarious or petal-like, the flowers usually small. Anthers entire at both ends, versatile, dorsally attached about the middle. Style subulate with a small terminal stigma. Caudex either very short, thick, and hard, or elongated and woody.*

Perianth-segments all free. Ovary 3-celled, with few ovules in each cell. Flowers in long dense cylindrical spikes, on a long scape or peduncle . . . . . 4. XANTHORRHÆA.

Outer perianth-segments united in a tube. Ovary 1-celled, with 3 (often only 1 perfect) ovules erect from a basal placenta. Flowers in globular heads on a terminal peduncle . . . . 5. DASYPOGON.

TRIBE III. **Calectasieæ.** *Perianth-segments all rigid, sometimes coloured. Anthers erect. Style subulate, with a small terminal stigma. Flowers rather large.*

Perianth segments erect and distinct from the base. Ovary 3-celled with 1 erect ovule in each cell.

Stamens exserted. Caudex long and woody. Flowers in globular heads on terminal peduncles enclosed in many sheathing bracts . . . . 6. KINGIA.

Stamens included. Flowers long and solitary within a tuft of rigid radical leaves . . . . 7. BAXTERIA.

Perianth hypocrateriform, usually blue, with a cylindrical tube. Ovary 1-celled with 3 erect central ovules. Flowers solitary on the short branches of leafy stems 8. CALECTASIA.

TRIBE IV. **Eujunceæ.** *Perianth small, the segments all free and glume-like. Anthers erect. Style with 3 linear stigmatic branches. Leaves grass-like or terete, mostly radical or none.*

Ovary 1-celled, with 3 erect ovules . . . . 9. LUZULA.

Ovary 1-celled, or more or less perfectly 3-celled, with several often many ovules to each placenta . . . 10. JUNCUS.

TRIBE I. XEROTEÆ. Perianth small, usually dry scarious or hyaline at least in the females, rarely almost petal-like. Anthers versatile, attached at the back between the basal lobes. Ovary 3-celled, with 1 laterally attached ovule in each cell.

1. XEROTES, Banks.

Flowers diœcious. Males: Perianth of 6 segments or lobes all equal and similar, free or united to the middle, or more frequently the 3 outer free from the base thin and hyaline or scarious, the 3 inner more petal-like and more united at the base. Stamens 6, 3 attached to the base or centre of the 3 inner segments or lobes, 3 alternating with them, all shorter than the perianth; anthers versatile, usually deeply lobed below their attachment and sometimes at the apex also, the cells then quite distinct and dorsally attached, opening in longitudinal slits. Ovary rudimentary or entirely deficient. Female fl.: Perianth persistent, usually of a firmer consistence than in the males, of 6 equal and similar segments. Stamens none or reduced to small clavate staminodia. Ovary sessile, 3-celled, with 1 (or rarely 2?) erect ovules laterally attached in each cell; style very short or scarcely any, with 3 recurved stigmatic lobes. Capsule nearly globular, surrounded by the persistent perianth, coriaceous, smooth and shining or transversely wrinkled or rarely longitudinally striate, opening loculicidally in 3 valves. Seeds ovoid globular or somewhat angular when all three ripen; testa thin, adnate, not black; albumen rather hard; embryo linear or very short, erect from the base of the seed.—Stems tufted on a very short or creeping rhizome or stock, either densely leafy at the base only or slender elongated and leafy. Scapes or peduncles either very short or the inflorescence sessile in the tufts of radical leaves or at the ends of the leafy stems or more or less elongated below the inflorescence. Flowers small, the males usually either in dense clusters or solitary along the branches of a panicle, sessile or pedicellate within short scarious bracts; the female inflorescences either similar to the males or less branched or reduced to single sessile globular heads, or rarely both sexes in dense globular or oblong heads along a simple rhachis or connected into a long dense cylindrical spike.

The genus is nearly limited to Australia, one species only being also found in New Caledonia. Some of the wide-spread species are very variable and difficult to define, and the difficulty is often much increased by the extreme rarity of female specimens in collections; and when present, the uncertainty of their being correctly matched, the difference in habit, especially in inflorescence, between the two sexes being sometimes very striking. In R. Brown's herbarium, the labels are unfortunately not corrected according to the Prodromus as in most other genera, and by some clerical error the wrong letters indicative of stations have been affixed to some of the diagnoses in that work. There are, however, numbers or other indications in the herbarium, which, with the aid of diagnoses, have enabled me to identify the whole of the species with tolerable certainty.

Sect. I. **Euxerotes.**—*Male flowers paniculate or racemose or clustered along a simple or branched rhachis. Female inflorescence similar or more simple. Perianth-segments free from the base in both sexes or in the males the inner ones only shortly united. Leaves densely crowded or tufted on the very short or slightly elongated leafy stem (except in X. pauciflora). Scapes or peduncles terminal.*

SERIES I. **Glomeratæ.**—*Male flowers sessile and numerous in sessile clusters. Capsules smooth or nearly so.*

Three of the stamens attached to the centre of the inner perianth-segments. Bracts obtuse and short.
Perianth about 1½ lines long, all the segments free from the base, thin and broad . . . . 1. *X. Banksii.*
Perianth about 1 line long, the inner segments connate to near the middle . . . . 2. *X. dura.*
Stamens all attached to the base of the segments.
Bracts, at least the lower ones, with subulate points usually exceeding the flowers. Leaves often rigidly 2-toothed at the apex. Eastern species . . . . . 3. *X. longiflora.*
Bracts scarious, obtuse, or very rarely with short points. Western species.
Leaves flat, 2 or more lines broad.
Leaves thick and rigid, under 1 ft. mostly 2-toothed at the end. Male scapes from the lower axils . 4. *X. rigida.*
Leaves above 1 ft. long, entire. Female scapes terminal, very short . . . . 5. *X. Drummondii.*
Leaves thick or terete, under 1 line broad.
Leaves rather thick. Scapes above 6 in. long . . 6. *X. Sonderi.*
Leaves filiform. Scapes under 4 in. long . . . . 7. *X. odora.*

SERIES II. **Fasciculatæ.**—*Male flowers numerous in sessile clusters (irregular in X. sororia), but on pedicels exceeding the bracts.*

Capsule transversely rugose. Eastern species.
Flowers numerous, in distinct clusters along the branches of the panicle or along a simple rhachis . . . . . 8. *X. multiflora.*
Flowers all erect and irregularly clustered in a small narrow compact panicle . . . . 9. *X. sororia.*
Capsule smooth. Western species.
Leaves glabrous, narrow linear or filiform. Male flowers in distinct clusters; perianth-segments pale with dark centres . . . . 10. *X. Endlicheri.*
Leaves hairy on the back at least at the base . . . . 11. *X. sericea.*
Leaves glabrous, flat, above 1 line broad, with thickened margins.
Male flowers dark purple in distinct clusters or rarely in a single terminal head . . . . 12. *X. purpurea.*
Male flowers pale coloured in small clusters, all contiguous or nearly so in a terminal spike . . . . 13. *X. Preissii.*

SERIES III.—**Sparsifloræ.**—*Male flowers pedicellate or rarely sessile, singly scattered in simple racemes or loose panicles, rarely here and there 2 or 3 together.*

Panicles loose (usually on very short scapes). Perianth-segments all similar, usually narrow or acuminate.
Hyaline bracts very prominent. Perianth-segments nearly 2 lines long . . . . 14. *X. effusa.*
Bracts minute. Perianth-segments scarcely 1 line long . 15. *X. micrantha.*
Panicles less branched or reduced to simple racemes. Inner perianth-segments thicker than the outer, usually ovate or broad.
Leafy base of the stems short and tufted.
Flowers pedicellate, in a narrow loose panicle or simple raceme. Eastern species . . . . 16. *X. filiformis.*
Flowers sessile, in a simple interrupted spike. Western species . . . . 17. *X. cæspitosa.*
Leafy stems slender, elongated. Leaves filiform. Racemes few-flowered. Western species . . . . 18. *X. pauciflora.*

SECT. II. **Cephalogyne.**—*Male flowers sessile in sessile or rarely pedunculate clusters or heads usually several on a common rhachis, the perianth divided to the middle only into*

6 equal lobes. Female flowers sessile in solitary sessile or very shortly pedunculate heads, the perianth divided to the base into 6 equal segments. Leafy stems often elongated, especially in the females, the scapes or peduncles terminal or in the upper axils.

Male flowers under 1 line or scarcely longer in several often numerous clusters.

Leafy stems elongated, with short twisted leaves. Female perianths rather rigid in globular sessile heads . . 19. *X. flexifolia.*

Leafy stems often elongated with scarcely twisted leaves more than 2 in. long. Female flowers of *X. flexifolia* 20. *X. glauca.*

Leafy base of the stems very short. Leaves above 1 ft. long. Female heads very scarious on very short peduncles.

Sheathing bases of the leaves with scarious margins splitting into numerous filaments. Eastern species. 21. *X. elongata.*

Sheathing bases of the leaves not splitting into filaments. Western species . . . . 22. *X. rupestris.*

Leafy base of the stems often several inches long. Leaves ½ to 1 ft., the sheathing base splitting into filaments. Female heads scarious. Western species . . . . 23. *X. collina.*

Male flowers often 2 lines long in single or few heads. Leafy base of the stems very short . . . . 24. *X. suaveolens.*

Male flowers unknown. Female perianths (perhaps not normal) split into masses of hair-like segments . . . 25. *X. turbinata.*

Sect. III. **Schœnoxeros.**—*Barren stems rushlike, leafless except sheathing scales at the base. Flowering scapes very short and leafless, with 2 or 3 flowerheads, males and females nearly similar.*

Bracts scarious, entire. Western species . . . . . . 26. *X. spartea.*

Bracts fringed or slit into hairs. S. Australian species . . 27. *X. juncea.*

Sect. IV. **Typhopsis.**—*Flower-heads or spikes globular or cylindrical, very dense, the bracts split into dense masses of woolly hairs, males and females similar.*

Leafy base of the stem very short. Leaves 1 to 2 ft. long . 28. *X. leucocephala.*

Sect. V. **Macrostachya.**—*Flower-clusters closely arranged in a long terminal cylindrical spike with scarious bracts, males and females similar.*

Leafy base of the stems very short. Leaves 2 to 3 ft. long 29. *X. hastilis.*

Section I. Euxerotes.—Male flowers paniculate or racemose or clustered along a simple or branched rhachis. Female inflorescence similar or more simple. Perianth-segments free from the base in both sexes, or in the males the inner ones only shortly united. Leaves densely crowded or tufted on the very short or slightly elongated leafy stem (except in *X. pauciflora*). Scapes or peduncles terminal.

Series I. Glomeratæ.—Male flowers sessile and numerous in sessile clusters. Capsule smooth or nearly so.

1. **X. Banksii,** *R. Br. Prod.* 263.—Leafy base of the stem often lengthening to 5 or 6 in., rather thick, densely covered with the sheathing bases of the leaves. Leaves distichous, spreading, mostly under 1 ft. long and about 3 lines broad, the sheathing bases with narrow scarious margins. Scapes stout, not long below the inflorescence. Male flowers forming a panicle of 8 in. to 1 ft. with long spreading open clustered branches, the flowers sessile in globular clusters sessile along the branches and at their base. Bracts numerous, hyaline, much shorter than the perianths. Perianth-segments all equal, ovate, thin,

hyaline, about 1½ lines long when fully out. Stamens 3 attached to the centre of the inner segments, 3 at their base alternating with them. Ovary usually present and not much shorter than the perianth, but narrow with imperfect stigmas and abortive ovules. Female inflorescence only seen in fruit, either quite simple with dense globular clusters of numerous flowers, or with a short branch bearing a small cluster proceeding from the lowest cluster. Capsule about 3 lines diameter, smooth or scarcely wrinkled.

Queensland. Endeavour River, *Banks and Solander*; Cooktown, *Fitzalan*; Cape York Peninsula, *Hann's Expedition*; Cape York, *Daemel*; frequent in islands off the coast, *C. Moore*; and apparently the same species, New Caledonia, *Vieillard* and others.

2. **X. dura**, *F. Muell. in Trans. Vict. Inst.* 1855, 42; *Fragm.* viii. 207.—Leafy base of the stem very short. Leaves 1 to 2 ft. long, mostly about 2 lines broad, rigid, flat or convex underneath, the sheathing base scarious on the margin. Scape short, thick, slightly flattened. Panicles both male and female much branched and very rigid, with small bracts and small flowers sessile or nearly so in numerous clusters at and along the ramifications. Male perianth campanulate, about 1 line long, the outer segments thin, ovate, obtuse, free from the base, the inner ones as long, but more petal-like and united at least to ⅓ of their length. Stamens with very short filaments, 3 attached to the centre of the inner lobes, 3 alternating with them at the top of the tube. No rudiment of the ovary. Female perianth-segments all nearly similar and free from the base. Capsule nearly globular, smooth, about 2 lines diameter.

S. Australia. Lofty ranges, *F. Mueller*; in the interior, *M'Dougal Stuart.*

3. **X. longifolia,** *R. Br. Prod.* 262.—Leafy base of the stems very short and tufted. Leaves radical or nearly so, 1 to 2 ft. long, flat or slightly concave, varying from 1 to 3 lines in width, rather rigid, mostly 2-toothed at the apex, with a short membranous sheathing base. Scape from under 1 ft. to nearly 2 ft. high including the inflorescence, much flattened below the panicle, which is sometimes almost reduced to a short and few-flowered interrupted spike, but more frequently pyramidal with numerous more or less clustered spreading branches, the whole inflorescence from 6 in. to nearly 1 ft. long. Flowers small, sessile and numerous in dense clusters sessile along the rhachis at the base and ends of the branches, the clusters more numerous in the males than in the females. Bracts under the clusters shortly broad at the base, usually with long rigid subulate points, sometimes all far exceeding the flowers, sometimes nearly all short except under the lowest clusters. Bracts or bracteoles subtending or enclosing the flowers broad and hyaline, shorter than the perianths, often very numerous in the females, fewer or united into one under each flower in the males. Perianth varying from 1 to nearly 2 lines in length, usually but not always larger in the females than in the males, the 3 outer segments

quite free, much imbricate, rigid and scarious though often very thin, the 3 inner more petal-like and obtuse but not longer, shortly united at the base in the males. Filaments short, dilated at the base, attached to the base of the inner perianth. Male flowers usually without any rudimentary ovary. Capsule shortly protruding from the persistent perianth, ovoid or almost globular, 2 to 3 lines diameter, hard, smooth and shining.—Hook. f. Fl. Tasm. ii. 63; F. Muell. Fragm. viii. 210; Bot. Reg. 1839, t. 3; *Lomandra longifolia*, Labill. Pl. Nov. Holl. i. 92, t. 119.

Queensland. Broad Sound and Thirsty Sound, *R. Brown*; from Moreton Bay, *F. Mueller* and others, to Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*; Burdekin River, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; very abundant in the northern districts, *Fraser*, *C. Stuart*, *Beckler*, and many others; in the interior to the Darling and Barcoo Rivers, *Fraser*, *Neilson*.

Victoria. Emu Creek, *Robertson*, common about Melbourne and along the Yarra, *Adamson*, *F. Mueller* and others, ascending on Mount Barklay to 5000 ft., *F. Mueller*.

Tasmania. *R. Brown*; abundant on dry and moist ground throughout the colony, *J. D. Hooker*.

South Australia. Rivoli Bay, *F. Mueller*.

This species varies like others in the length and breadth of the leaves, but much more conspicuously in the size and ramification of the panicle, in the colour of the perianth when dry from brown and shining to colourless and almost hyaline, and according to collectors when fresh from a golden yellow to black or yellowish white, and especially in the number and length of the prominent subulate bracts. When the specimens known were but few, they seemed to present several distinct forms which are now found to pass so gradually into each other that we are compelled to unite the following species proposed by Brown (Prod. 262): *X. longifolia*, R. Br. from Port Jackson and Tasmania, *X. fluviatilis*, R. Br. from Grose River, and *X. arenaria*, Br. from Broad Sound and Thirsty Sound, all merge into the common paniculate forms of the species; *X. montana*, R. Br. from Grose river, which we have also from near Sydney, *J. D. Hooker*, and from Mount Tomah, *A.* and *R. Cunningham*, is a variety with the inflorescence almost reduced to a single spike of 1 to 2 in. with the subulate bracts mostly scarcely exceeding the perianths, a few of the lower ones only in some specimens considerably longer. *X. hystrix*, R. Br., from Hunter's, Paterson's, and Williams' Rivers, is a variety with much branched panicles, 2 to 5 outer bracts to each cluster, very divaricate, subulate, and ½ to 1 in. long, whilst the flowers are small. We have it also from several collectors in the northern districts of N. S. Wales. Another paniculate variety, with the subulate bracts few and very small, was gathered by *F. Mueller* on Gillebrand's River and some other localities, but the specimens are old and the longer bracts probably worn away.

4. **X. rigida,** *R. Br. Prod.* 261.—Leafy stem shortly developed, rather thick, terminating a creeping rhizome. Leaves thick and rigid, under 1 ft. long, 2 to 2½ in. wide, spreading, obtuse truncate or unequally 2-toothed at the apex, the short broad imbricate sheaths covering the base of the stem, with broad scarious margins more or less red in the dried specimens. Male scapes from some of the lower axils flat and broad, 3 to 4 in. long including the inflorescence which occupies half the length and is shortly branched at the base. Flowers sessile in sessile clusters, the scarious hyaline bracts shorter than the perianth or the outer ones produced into a short point. Perianth-segments all equal and similar, narrow, about 1½ lines long. Stamens

attached to the base of the segments, those opposite the outer segments with much shorter filaments than the others. No rudimentary ovary. Female flowers and fruits unknown.—*Lomandra rigida*, Labill. Pl. Nov. Holl. i. 93, t. 120.

W. Australia, *Labillardière.* Lucky Bay, *R. Browne;* Cape Arid, *Maxwell.*

5. **X. Drummondii,** *F. Muell. Herb.*—Leafy base of the stem very short. Leaves 1 to 2 ft. long, rather rigid, flat, 2 to 3 or rarely 4 lines broad, mostly rounded at the apex, the imbricate sheathing bases rather long, with brown scarious margins not splitting into filaments. Male plant unknown. Female panicle sessile amongst the leaves, loosely branched, about 2 in. long, in fruit only in the specimens seen. Capsules subtended by perianth-segments rather more than 1 line long, apparently solitary within each bract, about 3 lines diameter, very smooth and shining, nearly globular when 2- or 3-seeded, very oblique or curved when 1-seeded.

W. Australia, *Drummond, n.* 59. This may possibly prove to be the real female of *X. Sonderi*, if the very different female specimens gathered by F. Mueller as such be properly referred to *X. odora* or *X. Endlicheri.*

6. **X. Sonderi,** *F. Muell. Fragm.* viii. 206.—Leafy base of the stem very short. Leaves 1 to 2 ft. long, rather rigid, flat, 1 to $2\frac{1}{2}$ lines broad, mostly rounded at the apex, the imbricate sheathing bases rather long with brown scarious margins not splitting into filaments. Male scapes terminal, flat, rigid, 6 to 8 in. long below the inflorescence which is usually about 2 in. long, and shortly branched. Flowers sessile, in dense sessile clusters. Bracts broad, scarious, without points and shorter than the perianths. Perianth-segments all free from the base and similar, ovate, rather rigid, about 1 line long. Stamens attached to the base of the segments. Female flowers and fruits unknown for certain.—*X. rigida,* Endl. in Pl. Preiss. ii. 50.

W. Australia. King George's Sound and adjoining districts, *Preiss, n.* 1559, *Drummond, n.* 209 *and* 364, *F. Mueller.*

The female specimens gathered by F. Mueller and referred to this species (Fragm. viii. 206) are precisely similar to those of *X. Endlicheri*, and have not the foliage of the male *X. Sonderi*, which much more nearly resembles that of *X. Drummondii.*

7. **X. odora,** *Endl. in Pl. Preiss.* ii. 50.—Leafy base of the stem very short. Leaves 1 ft. long or more, very narrow almost filiform, slightly flattened, striate, with narrow scarious imbricate sheathing bases. Male scapes filiform, 2 to 4 in. long, including the simple inflorescence of about 1 in. Flowers sessile in sessile clusters along the rhachis. Bracts scarious, obtuse, shorter than the perianth. Perianth-segments all equal and free from the base, ovate, about $\frac{3}{4}$ line long. Stamens attached to the base of the segments. Female flowers and fruit unknown.

W. Australia. Swan River, *Drummond,* 1st *coll.*; *Preiss, n.* 1529. This species appears to me to be nearly allied to *X. Sonderi*, rather than to *X. Endlicheri*, to which *F. Mueller* refers it, Fragm. viii. 205.

SERIES II. FASCICULATÆ.—Male flowers pedicellate and numerous in sessile clusters (irregular in *X. sororia*).

8. **X. multiflora**, *R. Br. Prod.* 262.—Leafy base of the stem very short and tufted. Leaves radical, rigid, 1 to 2 ft. long, varying from very narrow to nearly 2 lines broad. Scape terete or slightly flattened under the inflorescence, and including the inflorescence often longer than the leaves, but sometimes quite short, usually rigid. Panicle from a few inches to 1 ft. long, the branches rigid, divaricate, mostly in clusters of 3 to 6 from the same node, rarely again branched. Male flowers clustered along the branches or at the ramifications, all pedicellate. Bracts and bracteoles numerous, small, scarious, the bracteoles often connate. Pedicels filiform, sometimes scarcely exceeding the bracts, sometimes 2 to 3 lines long. Perianth-segments free nearly from the base, about 1 line long, the inner rather longer than the outer and sometimes slightly acuminate. Filaments rather long, 3 of them adnate to the inner segments nearly half way up, the other 3 free almost from the base. Female rhachis simple or with a few branches from the lower clusters. Flowers sessile, longer than in the males, the perianth-segments attaining sometimes 2 lines. Capsule about 3 lines diameter, the valves rigidly coriaceous, marked with more or less prominent transverse wrinkles.—*X. Brownei*, F. Muell. Fragm. viii. 206.

N. Australia. Islands off the north coast, *R. Brown.*

Queensland. Endeavour River and Bustard Bay, *Banks and Solander*; Keppel Bay, *R. Brown*; Moreton Bay, *Flood*; Peak Downs, *F. Mueller*; Rockhampton, *Thozet, O'Shanesy, Bowman*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart*; Hastings River, *Beckler*; Richmond River, *Fawcett*; Clarence River, *Wilcox.*

Victoria. Wendu Vale, *Robertson*; Glenelg River, *F. Mueller*; Portland, *Allitt.*

S. Australia. Encounter Bay, *Whittaker.*

The species varies much in the degree of ramification of the panicle, and the specimens described by R. Brown, Prod. 262, as *X. distans* and *X. æmula* from Sydney, *X. decomposita* from the north coast, and *X. media* and *X. multiflora* from Queensland, appear to me to be all only slight varieties of one species.

9. **X. sororia**, *F. Muell. in Herb. Kew.* Habit of the long rigid narrow-leaved forms of *X. filiformis*, but the panicles small, very narrow and compact, with very short erect branches or reduced to a single spike, and the flowers all erect and very shortly pedicellate. Fruit (in the Rockhampton specimens) rather longer than in *X. filiformis*, deeply marked with transverse wrinkles.

Queensland. Rockingham Bay, *Dallachy*; Bowen River, Rockhampton, *Bowman.*

Victoria. Mount M'Ivor, *C. Stuart*; Grampians, *F. Mueller.*

S. Australia. St. Vincent's Gulf, *F. Mueller.*

The specimens from all the localities are few or single only, and the species requires further illustration. It may prove to be a remarkably aberrant form of *X. multiflora.*

10. **X. Endlicheri,** *F. Muell. Fragm.* viii. 205.—Leafy base of the stem very short. Leaves narrow-linear or filiform, striate, flat or concave, from under 1 ft. to nearly 2 ft. long, the scarious imbricate sheathing bases rather long but very narrow. Scape slender, very variable in length, but always shorter than the leaves, the inflorescence simple or slightly branched. Male-flowers pedicellate in sessile clusters along the rhachis, the broad scarious bracts shorter than the filiform pedicels. Perianth-segments all free, ovate-oblong, thin and light-coloured with darker centres, varying from a little more than 1 line to nearly 2 lines in length, the inner ones rather larger than the outer. Filaments 3 attached to the base of the inner segments, 3 alternating with them. Ovary rudimentary. Female inflorescence simple, the flowers sessile and few in the clusters. Perianth nearly 2 lines long. Ovary very prominently 3-angled, tapering into a short style with recurved stigmatic lobes. Capsule ovoid, truncate, about 3 lines long, quite smooth.—*X. tenuifolia*, Endl. in Pl. Preiss. ii. 49, not of R. Br.

W. Australia. King George's Sound to Swan River, *Drummond*, 1*st coll. and n.* 816, *Harvey*, *Preiss*, *n.* 1530, *F. Mueller*, *Oldfield* and others; Port Gregory, *Oldfield.* The Swan River specimens have usually smaller flowers than those from King George's Sound, but do not otherwise differ.

11? **X. sericea,** *Endl. in Pl. Preiss.* ii. 51.—Closely allied to *X. Endlicheri*, of which F. Mueller (Fragm. viii. 206) thinks Oldfield's specimens may be a variety, with the lower part of the leaf sprinkled on the back and margins with long loose soft hairs not observed in any other species. Leafy base of the stem very short or slightly elongated. Leaves 1 to 2 feet long, flat or concave. Scape short, with a more branching and compact panicle than in *X. Endlicheri*, the pedicels very short. Flowers small but otherwise the same as in *X. Endlicheri.* Filaments very short, with ovate anthers. Females not seen.

W. Australia. Grantham, *Preiss*, *n.* 1542; Harvey River, *Oldfield*; Hampden, *Clark.* I have not seen Preiss's typical specimens, but the single ones from the two other stations agree with Endlicher's imperfect character. The species requires further investigation.

12. **X. purpurea,** *Endl. in Pl. Preiss.* ii. 49.—Leafy base of the stem very short and tufted, when old often surrounded by numerous split remains of old sheaths. Leaves very rigid, under 1 ft. long, 1 to 3 lines broad, thick, strongly striate, with prominent thick margins. Scapes longer than the leaves and sometimes attaining 2 feet, usually simple, with several globular sessile heads or umbels of numerous dark purple flowers, but sometimes reduced to a single terminal head, and occasionally 2 or 3 smaller pedunculate clusters proceeding from the lowest primary cluster. Bracts small, scarious, the outer ones ovate,

acuminate, the inner ones and bracteoles much shorter broad and obtuse. Perianth rotate, spreading to about 2 lines diameter, the segments all equal or the inner rather broader and almost petal-like. Anthers small, the bright yellow contrasting with the deep purple of the segments. Rudimentary ovary very small, conical, obtusely 3-angled. Female flowers unknown.

W. Australia. Swan River, *Drummond*, 1*st coll. Preiss*, *n.* 1534; Vasse River, *Oldfield*; Blackwood River, *Mrs. Hard*; Upper Hay River, *Miss Warburton*; Lake Muir, *Muir*.

Var. *capitata.* Inflorescence reduced to a single ovoid or globular terminal head, the pedicels short, but the flowers those of *X. purpurea*, not of *X. Preissii*.—Upper Hay and Kalgan Rivers, *F. Mueller*, *Miss Warburton*.

13. **X. Preissii,** *Endl. in Pl. Preiss.* ii. 50.—Very near *X. purpurea* and referred to it as a variety by *F. Mueller*. Leaves mostly longer and narrower, but the broadest of them have the thickened margins of that species. Scapes attaining 1 to 2 ft., but often not so long as the leaves, bearing a simple cylindrical spike of 1 to 1½ in., either quite close or slightly interrupted at the base. Male flowers much smaller than in *X. purpurea* and pale coloured, very shortly pedicellate in little dense globular clusters, all contiguous or the lower ones shortly distant. Perianth scarcely 1½ lines diameter when spread out, the structure otherwise as in *X. purpurea*. Female spike and habit the same as the male, but the flowers fewer sessile and rather larger. Ovary obtusely triquetrous, with a very short conical style and 3 large recurved stigmatic lobes. Stamens usually present, but with small imperfect anthers. Fruit of *X. Endlicheri*, but much smaller.

W. Australia. King George's Sound, *Maxwell*; Swan River, *Drummond*, 1*st coll. and n.* 807 *and* 808; *Priess, n.* 1532; Cape Naturaliste, *Oldfield*.

SERIES III. SPARSIFLORÆ.—Male flowers pedicellate or rarely sessile, singly scattered in simple racemes or loose panicles, rarely here and there two or three together.

14. **X. effusa,** *Lindl. in Mitch. Three Exped.* ii. 101.—Leafy base of the stem very short. Leaves densely tufted, long and rush-like rarely above 1 line broad and 2-pointed at the end, with rather long sheathing bases, the inner sheaths with scarious margins splitting into filaments. Flowers in slender spreading panicles of 2 to 4 in., nearly sessile within the tuft of leaves. Scarious bracts under the branches and pedicels very prominent, hyaline, ovate or lanceolate. Male flowers scattered along the branches, on filiform pedicels shorter than or more frequently longer than the perianth, solitary or rarely with a second more sessile flower within the same bract. Segments all free, lanceolate, of a slender almost petal-like consistence, nearly 2 lines long. Female flowers on shorter more rigid pedicels or quite sessile, rather

longer than the males. Capsule fully 4 lines diameter, the valves striate lengthwise.—*X. fragrans*, F. Muell.; Sond. in Linnæa, xxviii. 219.

N. S. Wales. In the interior? *Clowes;* towards the Murray River, *Mitchell.*
Victoria. Portland, *Allitt;* Murray River, *Beckler.*
S. Australia. From St. Vincent's Gulf to the Murray, *F. Mueller* and others; York Peninsula, *Miss Salmon.*
W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 811; Port Gregory and Murchison River, *Oldfield;* Champion Bay, *Miss Guerin.*

15. **X. micrantha,** *Endl. in Pl. Preiss.* ii. 49.—Stems tufted, leafy at the base only. Leaves terete or slightly flattened and very narrow, usually striate, 6 in. to 1 ft. long, the scarious margins of the sheathing bases often split into filaments. Scape much shorter than the leaves, bearing in the males a panicle with filiform spreading branches and very minute bracts. Flowers scattered, solitary or 2 or 3 together under each bract, nearly sessile or the pedicel not exceeding the perianth. Perianth-segments all equal, very spreading, about 1 line long, dark coloured when dry. Female inflorescence much less branched and often quite simple, the flowers larger than in the males, often reflexed, the segments more rigid and less spreading. Capsule depressed-globular, nearly 3 lines diameter, quite smooth, the persistent perianth closely appressed to its base.

Victoria. Wimmera, *Dallachy;* Mount William, *Sullivan.*
S. Australia. Macclesfield, *F. Mueller;* Port Lincoln, *Wilhelmi.*
W. Australia. King George's Sound, *Muir;* Swan River, *Drummond*, 1*st coll. and n.* 809; *Preiss, n.* 1531.

Var. *sororia*, F. Muell. Leaves above 1 ft. long, flat, at least 2 lines broad. Panicle spreading, 6 to 10 in. long.—Mount Wellington, Gipps' Land, *F. Mueller.* Perhaps a distinct species.

16. **X. filiformis**, *R. Br. Prod.* 261.—Stems tufted, on a short hard rhizome, sometimes forming a very short branching caudex. Leaves radical, narrow-linear, sometimes almost terete and filiform, frequently canaliculate or flat and 1 to 2 lines broad or very rarely even broader; in luxuriant specimens 1½ to 2 ft. long, in dwarf specimens or varieties under 6 in., varying as in other species smooth or slightly scabrous. Scape very short under the inflorescence, terete or flat. Panicle narrow-pyramidal, sometimes almost reduced to a simple raceme of 2 or 3 in., almost sessile in the leaf-tufts, and varying from that to a length of 6 in. on a scape of 2 or 3 in., but always much shorter than the leaves, the branches short, the lowest often clustered. Flowers small, globular or ovoid, scattered along the branches on short recurved pedicels, each subtended by a narrow acute scarious bract shorter than the pedicel. Perianth-segments 1 to 1½ lines long, generally larger in the females than in the males, the inner ones ovate or orbicular rather thick and petal-like, the outer thinner shorter and greenish. Filaments very short, 3 attached to the centre of the inner segments, 3 alternate with them at their base. No rudimentary ovary in the males nor staminodia in the females. Capsule ovoid-globular, about 3 lines diameter, often oblique by the abortion of 1 or 2 of the cells, the peri-

carp smooth, hard or almost fleshy, tardily opening.—*Dracæna filiformis*, Thunb. Diss. Drac. 4, fig. 1; *Xerotes Thunbergii*, F. Muell. Fragm. viii. 208.

Queensland. Moreton Bay, *F. Mueller* and others; Darling Downs, *Law*; Cooper's Creek, *Bowman*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 496 and others; Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler*, *Wilcox*, *Fawcett*.

Victoria. Wendu Vale, *Robertson*, common about Port Phillip and on the Yarra, *Gunn*, *F. Mueller* and others; Grampians, *F. Mueller*; East Gipps' Land, *Walter*.

S. Australia. St. Vincent's Gulf, *F. Mueller*.

I should include as scarcely distinct varieties of X. *filiformis*, four others proposed by Brown, Prod. 261, as species, all from Port Jackson: X. *laxa*, a rather broad long-leaved form, X. *gracilis* a long slender-leaved form, X. *tenuifolia* (marked by mistake in the Prodromus M.), finer leaved specimens than the typical X. *filiformis*, and X. *denticulata*, very slender, with short leaves.

17. **X. cæspitosa,** *Benth.*—Leafy base of the stem very short, but densely tufted on the rhizome. Leaves very narrow, subulate or filiform, 6 in. to nearly 1 ft. long, with scarious or brown sheathing bases. Scapes 2 to 3 in. long including the spike, which is usually simple and continuous or slightly interrupted. Male flowers sessile, scattered, solitary within the bracts, but sometimes 2 or 3 close together. Perianth-segments nearly 1½ lines long, the outer ones free very broad and hyaline; the inner rather longer and narrower more erect and somewhat petal-like. Stamens 3 attached to the inner segments, 3 at their base alternate with them; anther-cells distinct, attached to a small connective. Ovary a small rudiment. Female spikes (if properly matched) longer than the males, the flowers all reflexed on short pedicels. Perianth-segments about 2 lines long, all rigid, rather narrow, the inner rather longer than the outer.

W. Australia. King George's Sound and Swan River, *Oldfield*, *Drummond*, 1st *coll. and n.* 810 *and* 817; Albany, *F. Mueller*. There are two varieties, one with longer rather broader leaves, dense male spikes, pale coloured perianth-segments the inner ones broadly ovate, the other with filiform leaves, more slender and interrupted male spikes, dark coloured perianth-segments the inner ones almost orbicular.

18. **X. pauciflora,** *R. Br. Prod*, 261.—Leafy stems slender, branching at the base, sometimes forming dense tufts about 6 in. high, sometimes elongated to 1 or even 1½ ft. Leaves filiform, 1 to 6 in. long, their sheathing bases narrow and striate, not scarious. Racemes terminal, filiform, simple or scarcely branched, shorter than the leaves. Flowers few, nodding, solitary within subulate scattered bracts mostly shorter than the pedicel, or the lowest bracts rather longer and the uppermost minute or wanting, the pedicels varying from 1 to 2 lines. Male perianth nearly globular, scarcely above 1 line diameter, outer segments thin and ovate, inner nearly twice as long, orbicular, concave, thick with inflexed scarious margins. Anthers 3 almost sessile in the centre of the inner segments, 3 on short filaments alternating with them. Ovary a small rudiment. Female perianth narrow-turbinate, about 2½ lines long, the inner segments obovoid-oblong, thick and

concave but less so than in the males, the outer shorter as in the males, but not so thin. Capsules about 3 lines diameter, smooth and shining. —*X. graminea*, Endl. in Pl. Preiss. ii. 48; *X. asparagoides*, Endl. l. c. 49.

W. Australia. King George's Sound, *R. Brown*, *Fraser*, *A. Cunningham* and many others; thence to Swan River, *Preiss*, *n.* 1556, 1557, *Oldfield* and others.

The letters J. and M. attached in Brown's Prodromus severally to *X. pauciflora* and *X. tenuifolia* have by some clerical or typographical error been transposed, and thence the present plant has been named in the Banksian herbarium by Solander as *X. tenuifolia.* But Brown's herbarium as well as his diagnoses clearly show that he applied the name of *X. pauciflora* to the King George's Sound plant with elongated leafy stems, and that of *X. tenuifolia* to the Port Jackson stemless plant which I have considered as a variety of *X. filiformis.*

SECTION II. CEPHALOGYNE.—Male flowers sessile in sessile or rarely pedunculate clusters or heads, usually several on a common simple or branched rhachis; perianth divided to the middle only into 6 equal lobes. Female flowers sessile in solitary sessile or very shortly pedunculate heads; perianth divided to the base into 6 equal segments. Leafy stems often elongated, especially the females, the scapes peduncles or sessile heads terminal or in the upper axils.

19. **X. flexifolia,** *R. Br. Prod.* 260.—Stamens slender, branching, leafy throughout, diffuse or ascending, rarely above 1 ft. long. Leaves linear, spreading, much twisted when dry, mostly 1 to 1½ in. long, their closely appressed sheaths covering the branches. Male flowers in dense globular clusters of about 3 lines diameter, sessile along the branches of a narrow panicle of 1 to 3 in., sessile or shortly pedunculate in the upper axils. Bracts small, scarious, obtuse. Perianth scarcely 1 line long, nearly globular, shortly divided into 6 nearly equal obtuse lobes. Stamens all inserted on the lobes below the middle. No rudimentary ovary. Female heads larger, solitary and closely sessile amongst the leaves. Perianth of 6 distinct lanceolate or ovate-acuminate segments, 1½ lines long or when in fruit 2 lines. No staminodia. Ovary very prominently 3-angled. Capsule not exceeding the perianth. —*Dracæna obliqua,* Thunb. Diss. Drac. 6, f. 2.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 432 or 482 and many others.

20. **X. glauca,** *R. Br. Prod,* 260.—A low tufted species, the leafy base usually very short but sometimes especially in the females lengthening out to 5 or 6 in., and densely covered by the leaf-sheaths. Leaves narrow-linear, spreading, mostly 2 to 3 in. long but sometimes nearly twice that length, straight or slightly twisted, always much less than in *X. flexifolia* and their sheathing bases more or less split into filaments. Male inflorescence simple or shortly branched from the lower clusters, the flowers small, in globular clusters along the rhachis. Perianth under 1 line long, pale-coloured, globular-campanulate,

divided to near the middle into 6 equal lobes. Stamens all inserted on the lobes below the middle. No rudimentary ovary. Female heads much larger, closely sessile or very shortly pedunculate amongst the upper leaves. Perianth-segments ovate-lanceolate, 1½ to near 2 lines long. Capsule scarcely exceeding the perianth, slightly marked with transverse wrinkles.—Hook. f. Fl. Tasm. ii. 63; X. *mucronata*, Sieb. Pl. Exs. not of R. Br.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 433 *or* 488 and many others. Twofold Bay, *F. Mueller*.
Victoria. Wendu Vale, *Robertson*; Wimmera, *Dallachy*.
Tasmania. Abundant in gravelly soil near Penguite, Norfolk Plains, etc., *Gunn* and others.
S. Australia. St. Vincent's Gulf, *F. Mueller*, *Behr*. and others; Venus Bay, *Warburton*; Rivoli Bay, *F. Mueller*.

Var. *occidentalis*. Leafy base of the stem not elongating but densely filamentose, with a male inflorescence more branched than in the common X. *glauca*; females not seen.

W. Australia. Cape Paisley and Esperance Bay, *Maxwell*. Possibly a distinct species.

21. **X. elongata,** *Benth.*—Leafy base of the stem very short. Leaves 1 to 1½ ft. long, very narrow, their sheathing bases rather long, with scarious margins splitting up into numerous filaments. Male inflorescence on a short scape simple or more frequently branched, 2 to 3 in. long, with small globular clusters of sessile flowers. Scarious bracteoles united round the flowers. Perianth above 1 line long when fully out, with a narrow turbinate dark-coloured entire base and 6 equal lobes shorter than the tube. Female flower-head solitary, globular, on a very short peduncle, the imbricate scarious bracts very prominent, with long points exceeding the flowers. Perianth stipitate within the bract, divided nearly to the base into petal-like segments above 1 line long.

Queensland. Moreton Island, *F. Mueller*.
N. S. Wales. New England, *C. Stuart*; Murray River and Mount Murchison, *Dallachy*.
S. Australia. Lake Bonney, *Herb. F. Mueller* (female specimens with leaves under 1 ft.).

22. **X. rupestris,** *Endl. in Pl. Preiss.* ii. 50.—Evidently nearly allied to X. *collina*, but the leafy stems do not appear to elongate below the sheathing bases of the actual leaves, though the rhizome or stock may be sometimes slightly elongated. Leaves very fine, linear-subulate, mostly above 1 ft. long, the broad sheathing bases not splitting into filaments. Male inflorescence like that of X. *collina*, but only seen in very young bud in Preiss's specimens; the females from Drummond's specimens have the ovoid-globular head and prominent scarious bracts of that species.

W. Australia. *Drummond, n.* 333 ♂ *and* 334 ♀ ; Cape Riche, *Preiss, n.* 1553.

23. **X. collina,** *R. Br. Prod.* 260.—Stems with a branching base lengthened to several inches, the lower part covered with the persistent bases of old sheaths, the upper part much thickened by the sheathing bases of perfect leaves. Leaves very narrow, straight or flexuose, flat or almost terete, the margins often scabrous, ½ 1 ft. long, the broad imbricate sheathing bases split into numerous filaments. Male inflorescences on short scapes slightly branched, 2 to 3 in. long, with rather numerous sessile clusters of flowers. Bracts very scarious or hyaline, with a broad base and fine points or lanceolate from the base, scarcely exceeding the perianth ; the bracteoles short broad and obtuse. Perianth campanulate, about 1 line long, divided to the middle or rather lower down into 6 lobes all equal, or the inner ones rather narrower. Stamens inserted at the base of the segments. No rudiment of the ovary. Female flower-head ovoid-globular, solitary on a peduncle shorter than itself. Bracts scarious-hyaline, larger than in the males. Perianths shorter than in the males and more deeply divided but otherwise similar. No staminodia. Ovary very prominently triquetrous. Fruit not seen.

W. Australia. Lucky Bay, *R. Brown*, and probably in the same district, *Drummond, n.* 116 *and* 318.

24. **X. suaveolens,** *Endl. in Pl. Preiss.* ii. 50.—Stems tufted, the leafy base exceedingly short. Leaves radical, flat or almost terete, ½ to 1 ft. long and under 1 line broad, the old sheathing bases splitting into filaments. Male scapes including the inflorescence 1 to 3 in. long, with 1 terminal and 2 to 4 lateral sessile or pedunculate heads of many flowers. Bracts and bracteoles broad, scarious and imbricate, but much shorter than the flowers. Perianth almost sessile, usually about 2 lines long but variable in size, infundibuliform, with 6 petal-like lobes about as long as the narrow tube, all nearly equal or the inner ones rather smaller. Anthers narrow-oblong, shortly lobed at each end, on short filaments attached to the base of the lobes. No rudiment of the ovary.—X. *umbrosa,* Endl. l. c.

W. Australia. Swan river, *Drummond,* 1*st. coll. and n.* 813 ; *Preiss, n.* 1535, 1536 ; Cape Lewin, *Collie.*

The perianths in *X. umbrosa* are much smaller than in the typical *X. suaveolens,* but are in all other respects the same. Drummond's n. 814 is probably the female of the same species. The leaves are broader (about 1 line), the flower-heads solitary on scapes of about 1 in., the bracts broader and altogether larger than in the males ; the perianth very much longer, nearly 4 lines, with narrow lobes longer than the tube. Ovary very prominently 3-angled.

25? **X. turbinata,** *Endl. in Pl. Preiss.* ii. 51.—Stems densely tufted, the leafy base very short. Leaves terete, acute, mostly about 1 ft. long, but in some specimens shorter, the outer ones short with broad sheathing bases splitting into filaments, the inner with narrow sheathing margins. Scapes 1 to 2 in. long, bearing a single ovoid-turbinate head 5 or 6 lines diameter. Bracts lanceolate-linear, very acute and rigid. Perfect flowers unknown, but in all the rather numerous specimens both of Preiss and Drummond there is within each bract what appears to be a perianth split nearly to the base into a dense tuft of long hairs enclosing an apparently imperfect narrow ovary, tapering into a short style, with minute spreading stigmatic lobes. Capsules (which I have not seen) transversely wrinkled according to Endlicher.

W. Australia. Swan river, *Preiss, n.* 1540; *Drummond, n.* 330.

Drummond's n. 124 may possibly be the male of this species, but the flowers are all fallen away from the specimens, leaving a short rhachis which had probably borne several heads.

SECTION III. SCHŒNOXEROS.—Barren stems rush-like, leafless except sheathing scales at the base. Flowering scapes very short and leafless, with 2 or 3 flower-heads, the males and females nearly similar.

26. **X. spartea,** *Endl. in Pl. Preiss.* ii. 51.—Stems numerous, tufted on a creeping rhizome, leafless except sheathing scales covering the base and often split into filaments, the inner ones sometimes bearing a short erect lamina, the stems mostly barren (described as leaves but enclosed in several sheaths and not dilated into a sheath at the base), terete, slender but rigid, 1 to 2 feet long. Flowering scapes attached to the rhizome, 1 to 3 in. long, leafless like the barren stems, bearing a terminal globular flower-head 1½ to 2 lines diameter and 1 to 4 globular clusters enclosing the scape lower down. Bracts and bracteoles scarious, shorter than the perianth. Perianth on a pedicel much shorter than the bract, campanulate, under 1 line long, divided to below the middle into 6 broad nearly equal segments, the outer ones much more coloured than the inner. Stamens attached to the base of the segments. No rudiment of the ovary. Females unknown.

W. Australia. Darling Range, rare, *Preiss, n.* 1533.

27. **X. juncea,** *F. Muell. in Hook. Kew Journ.* viii. 333.—Stems numerous, tufted on a creeping rhizome, leafless except sheathing scales covering the base for about 1 in., of which 1 or 2 sometimes bear a short lamina; barren stems as in *X. spartea*, described as leaves, terete, rigid, rush-like, ending in a pungent point, mostly under 1 ft. high. Flowering scapes very much shorter, attached to the rhizome, with a terminal globular head 3 or 4 lines diameter, and 2 or 3 others lower down sessile and enclosing the scape. Bracteoles nearly as long as the perianth, split into a hairy fringe as in *X. leucocephala*, but not nearly so deeply. Flowers only known from the remnants of some

old ones, apparently like those of *X. leucocephala.* Capsule obovoid-globular, shortly acuminate, 3-furrowed, smooth, about 3 lines diameter.

S. Australia. Port Lincoln, *Wilhelmi.*

SECTION IV. TYPHOPSIS.—Flower-heads or spikes globular or cylindrical, very dense, the bracts split into dense masses of woolly hairs; males and females similar.

28. **X. leucocephala,** *R. Br. Prod.* 260.—Stems tufted with very short leafy bases. Leaves radical or nearly so, 1 to 2 ft. long and scarcely above 1 line broad, with scarious margins at the base split into long fine filaments, and bordered here and there by a few filaments higher up. Scapes much shorter, rarely attaining 1 ft., slender and terete or slightly flattened in the lower portion. Flower-heads usually globular or ovoid, very dense, about ½ in. diameter, either solitary and terminal or with 2 or 3 additional ones enclosing the scape at a distance from each other, or rarely 2 or 3 united in a cylindrical terminal spike. Bracts subtending the flowers shorter than the perianth, or rarely with subulate points protruding from the head before the flowers expand. Scarious bracteoles split low down or quite to the base into very numerous crisped filaments or hairs as long as the perianth, giving the head a woolly appearance and often described as wool on the receptacle. Perianth infundibuliform, 2½ to nearly 3 lines long, with 6 ovate lobes, 3 outer hyaline attached about halfway up the tube, 3 inner ones longer more petal-like and white about half as long as the tube. Stamens in the males attached immediately below the inner lobes. Ovary rudimentary at the bottom of the tube. Female flower-heads sometimes closely resembling the males, but more frequently forming a continuous spike. Outer perianth-segments rather larger in proportion to the inner. Ovary obovoid, almost stipitate. Fruit obovoid, acuminate, hard and shining.—*X. filamentosa,* A. Cunn. MS.; Brongn. in Duperr. Voy. Bot. 183, t. 35; *X. typhina,* Lindl. in Mitch. Three Exped. ii. 41.

Queensland. Keppel Bay, *R. Brown;* Port Curtis, *M'Gillivray;* Darling Downs, *Law;* Curriwillighie, *Dalton;* Boyne, *Hartmann.*

N. S. Wales. In the N. W. interior, *Fraser, A. Cunningham;* New England, *Leichhardt;* Balonne River, *C. Moore;* Mudgee, *Woolls;* Murray River, *Mitchell;* Lachlan and Darling Rivers and thence to the Barrier Range, *Victorian and other Expeditions.*

Victoria. N. W. districts, *L. Morton* and others.

S. Australia. Encounter Bay, *Whittaker;* St. Vincent's Gulf, *F. Mueller* and others; Lake Gairdner, *Babbage;* north of Fowler's Bay, *Giles.*

SECTION V. MACROSTACHYA.—Flower-clusters closely arranged in a long terminal cylindrical spike with scarious not filamentose bracts and bracteoles, the males and females similar.

29. **X. hastilis**, *R. Br. Prod.* 263.—Stems tufted, the leafy base very short. Leaves radical or nearly so, 2 to 3 feet long, 2 to 3 lines broad, the brown scarious margins of the sheathing bases at length splitting into filaments. Scape terete or nearly so, several feet high, bearing a dense continuous cylindrical spike 6 in. to 1 ft. long and 5 to 6 lines diameter, nearly similar in the males and females. Bracts short broad and scarious, bracteoles similar, nearly as long as the perianths, more or less united in a cup round each flower and persistent after the flowers have fallen away. Perianth campanulate, nearly 2 lines long, divided in the males almost to the base into 6 nearly equal deeply coloured segments, more united at the base in the females. Stamens attached to the base of the segments, usually rudimentary in the females. Ovary rudimentary but present in the males, attached by a broad base to the thick base of the perianth; in the females also broadly attached, acuminate. Capsule broadly obovate, acuminate, hard, 3-furrowed, rather longer than the perianth.—Endl. in. Pl. Preiss. ii. 51.

W. Australia. King George's Sound, *R. Brown*; in various places to the eastward, but rare, *Maxwell*, *Drummond*, *n.* 331, *Preiss*, *n.* 1551.

Before the flowers expand they appear to be in short sessile distinct spikelets with the subtending bracts distichously imbricate, but at the time of flowering they are all consolidated into the long spike above described, with something of the aspect of a *Xanthorrhæa*.

2. CHAMÆXEROS, Benth.

Flowers hermaphrodite or perhaps polygamous. Perianth of 6 segments all nearly equal, the 3 outer rather more rigid and broader than the 3 inner. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them, all shorter than the perianth; anthers versatile, shortly lobed at both ends, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 1 ovule laterally attached in each cell; style filiform, with a small terminal stigma. Fruit unknown, probably the same as in *Xerotes*.—Tufted perennials, with the habit of some species of *Xerotes*. Leaves radical, rigid, the young ones bordered by a scarious lacerated margin. Scapes short. Flowers pedicellate, in sessile clusters, with short imbricate scarious bracts.

The genus is limited to West Australia, and has been included in *Xerotes*, from which it differs in the flowers mostly hermaphrodite and the filiform undivided style, neither of which characters, any more than the lacerated margins of the leaves, occur in any of the numerous species known of *Xerotes*.

Leaves flat. Scapes with a single terminal globular flower-head or umbel	1. *C. Serra.*
Leaves terete. Scapes with a branching panicle of small flower-clusters	2. *C. fimbriata.*

1. **C. Serra**, *Benth.*—Stems densely tufted, the very short base covered with imbricated sheathing scales. Leaves in radical tufts,

erect, rigid, flat, scarcely above 6 in. long, 1 to 1½ lines broad, bordered the greater part of their length by a narrow scarious margin broken up into reflexed serratures and sometimes wearing off from the older leaves. Scapes rigid, proceeding from the imbricate scaly base of the stock by the side of the leaf-tufts, about 1 in high, bearing a single umbel or cluster of numerous flowers, the very numerous scarious imbricate bracts and very broad bracteoles forming an obovoid or globular head 3 to 4 lines diameter. Pedicels filiform, 2 or 3 times as long as the bracts. Perianth-segments narrow, about 2 lines long. Stamens nearly as long, with ovate anthers. Ovules apparently perfect in all the flowers examined.—*Xerotes serra*, Endl. in Pl. Preiss. ii. 49.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 819; *Preiss, n.* 1539; Stirling Range, *F. Mueller*.

2. **C. fimbriata,** *Benth.*—Leaves distichously sheathing on the very short base of the stem, erect, often curved, rigid, terete or slightly flattened, 1 to 1½ in. long, the younger ones bordered by a narrow scarious lacerated margin which disappears from the older ones. Scapes from within the tufts very short, bearing a loose branching pyramidal panicle of 2 to 4 in., the branches divaricate and almost filiform. Flowers pedicellate in small clusters of short scarious bracts, terminal or sessile along the branches, the filiform pedicels usually at least as long as the perianth. Perianth-segments oblong, a little more than 1 line long. Anthers small, on filiform filaments. Ovules apparently perfect in the flowers examined —*Xerotes fimbriata*, F. Muell. Fragm. viii. 211.

W. Australia, *Drummond, n.* 329.

3. ACANTHOCARPUS, Lehm.

Flowers hermaphrodite. Perianth of 6 segments, all equal, thin almost hyaline with a more opaque centre. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them; anthers versatile, lobed at the base, the cells opening inwardly in longitudinal slits. Ovary sessile, tapering into a short style with a small stigma, 3-celled, with 1 ovule laterally attached in each cell. Capsule globular, 3-valved, muricate. Seeds nearly globular, laterally attached; testa thin and appressed; albumen hard, embryo linear, slightly curved, oblique in the lower part of the seed. Stems slender, leafy. Flowers small, nearly sessile in terminal clusters.

The genus is limited to the single Australian species, differing from *Xerotes* like *Chamæxeros* chiefly in the hermaphrodite flowers and undivided style.

1. **A. Preissii,** *Lehm. in Pl. Preiss.* ii. 274.—Habit nearly of *Xerotes flexifolia.* Stems rigid but rather slender, with numerous short divaricate branches, forming either dense tufts of 6 in. to 1 ft. or a straggling shrub of 1 to 2 ft. Leaves numerous, with long striate sheaths covering the branches, the blade spreading, linear, rigid, from subulate to almost lanceolate, ½ to nearly 2 in. long, straight or slightly

twisted. Flower-heads or clusters small sessile and terminal or becoming lateral by the elongation of the branch. Bracts scarious, broad, shorter than the perianth. Flowers sessile or nearly so. Perianth-segments oblong, from 1¼ to nearly 2 lines long, the outer ones rather more rigid than the inner. Anthers ovate. Capsule 3 or 4 lines diameter, straw-coloured, the valves densely muricate with short points or tubercles.—*Xerotes echinata*, A. Cunn. Herb.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 304, 820, *Preiss*, *n.* 428, 3298; Murchison River, *Oldfield:* Rottenest and Dirk Hartog's Islands. *A. Cunningham.*

The species varies much in the length and breadth of the leaves, in the size of the flowers in rather dense clusters or almost solitary, closely sessile or shortly pedicellate, and somewhat in the texture of the perianth, but I have never seen even in Preiss's own specimens the outer-segments herbaceous nor really acute nor 2 seeds in each cell of the capsule as described by Lehmann.

Xerotes mucronata, R. Br. Prod. 260, from Lucky Bay, of which the specimens in Herb. Br. are in leaf only, with slight remains of flowers, may possibly be the *Acanthocarpus Preisii.*

Tribe II. Xanthorrhææ.—Outer perianth glume-like, inner thin and scarious or petal-like, the flowers usually small. Anthers entire at both ends, versatile, dorsally attached about the middle. Style subulate, with a small terminal stigma. Caudex either very short thick and hard, or elongated and woody.

4. XANTHORRHÆA, Sm.

Perianth persistent, of 6 distinct segments, the 3 outer glume-like, erect, concave or almost hoodshaped at the top, 3- or 5-nerved, almost scarious on the margins, the 3 inner much thinner, usually 5-nerved, erect within the outer ones but more or less protruded beyond them into a short hyaline or white and petal-like spreading lamina. Stamens 6, hypogynous or those opposite the inner segments slightly adherent to their base, longer than the perianth and all equal; filaments somewhat flattened or thickened at the base, usually spreading horizontally beyond the perianth, contracted at the end into an inflexed point; anthers oblong or rarely ovate, entire at both ends, dorsally attached in the middle, the cells opening longitudinally. Ovary sessile, 3-celled, with few ovules in each cell near the base, tapering upwards into an undivided subulate style, with a terminal entire or 3-grooved stigma. Capsule protruding from the persistent perianth, ovoid or acuminate, hard brown and shining, 3-valved. Seeds 1 or 2 in each cell, erect, ovate or oblong, flat, bordered by narrow margins; testa black, almost crustaceous but not shining; albumen fleshy but very firm almost cartilaginous; embryo linear, transverse in the middle of the seed, straight or curved.—Long-lived perennials, with a thick woody caudex, from very short to arborescent. Leaves in a dense tuft at the top of the caudex, long-linear, brittle, spreading or recurved, their broader closely imbricate bases remaining long persistent. Scape or peduncle terminal, hard, often several feet long, terminating in a dense cylin-

drical spike of numerous sessile flowers, closely packed with numerous bracteoles surrounding each flower within a small or subulate subtending bract. Caudex in several species emitting a copious dark or yellow resinous gum.

The genus is limited to Australia, where under the name of 'grass-trees' or 'blackboys' some of the species form a conspicuous feature in the landscape.

Inner perianth-segments with obovate or orbicular white laminæ conspicuously spreading above the outer ones. Spikes short (rarely 8 in.). Caudex very short.
  Bracts and outer perianth-segments glabrous. Eastern species.
    Spike above 1 in. diameter. Inner perianth-segments 5 lines long. Stamens twice as long . . . . . 1. *X. macronema.*
    Spike 7 or 8 lines diameter. Inner perianth-segments about 3 lines long . . . . 2. *X. minor.*
  Bracts and outer perianth-segments tipped with a dark pubescence. Western species . . . . 3. *X. gracilis.*
Inner perianth-segments with shortly dilated hyaline or whitish ends, but little longer than the outer and scarcely spreading.
  Leaves much flattened, narrow. Scape under 1 ft., spike about 1 in. long . . . . 4. *X. pumilio.*
  Leaves much flattened and mostly 2 to 3 lines broad (except towards the point). Spike 2 to 6 ft. long.
    Spike densely tomentose-pubescent. Caudex very short . . . . 5. *X. hastilis.*
    Spike glabrous or nearly so.
      Bracteoles obtusely spathulate or scarcely acuminate. Caudex arborescent. Eastern species 6. *X. arborea.*
      Bracteoles much acuminate. Caudex very short. Southern species . . . . 7. *X. semiplana.*
  Leaves 1 to nearly 2 lines broad, the dorsal angle usually and the facial one sometimes acutely prominent.
    Subtending bracts with subulate points very prominent on the young spike.
      Caudex very short. Spike usually under 1 ft. long 8. *X. bracteata.*
      Caudex shortly arborescent. Spike usually 2 ft. or more . . . . 9. *X. australis.*
    Subtending bracts concealed under the bracteoles and perianth. Caudex usually arborescent. Spike 2 to 6 ft.
      Scape usually longer than the spike. Southern species . . . . 10. *X. quadrangulata.*
      Scape usually not so long as the spike. Western species . . . . 11. *X. Preissii.*

1. **X. macronema,** *F. Muell. Fragm.* iv. 112.—Caudex not seen. Leaves narrow nearly flat or acutely triquetrous, 2 to 3 ft. long. Scapes above 1 ft. long. Spike 4 to 8 in. long, thick and very dense, the flowers much flattened and larger with longer stamens than in any other species. Bracts linear-spathulate, quite glabrous, nearly as long as the outer perianth-segments. Outer segments oblong, shortly acuminate, about 3 lines long, concave, quite glabrous, inner segments fully 5 lines

long, with white obovate spreading laminæ. Stamens nearly twice as long as the perianth; anthers ovate-oblong.

Queensland. Moreton Island, *M'Gillivray.*
N. S. Wales. Hastings River, *Beckler;* Brunswick and Tweed Rivers, *C. Moore.*

2. **X. minor,** *R. Br. Prod.* 288.—Leaves crowded on the very short and thick caudex, 1 to 2 ft. long and from 1 to nearly 2 lines wide, flat but thick or more or less triquetrous. Scape when full grown often longer than the leaves, the spike 3 to 6 in. rarely 7 or even 8 in. long, 7 to 8 lines diameter when fully out. Spathulate bracts and outer perianth-segments shortly acuminate, about 2 lines long, quite glabrous or minutely ciliate at the end; inner segments with white obovate spreading laminæ scarcely 1 line broad. Stamens about twice as long as the perianth, very spreading; anthers ovate-oblong, much smaller than in most species. Capsule acuminate and 7 to 8 lines long in some of the northern specimens, shorter and more obtuse in the southern ones.—Hook. f. Fl. Tasm. ii. 59; F. Muell. Fragm. iv. 112; Bot. Mag. t. 6297.

N. S. Wales. Port Jackson, *R. Brown, Backhouse;* Richmond River, *Mrs. Hodgkinson.*
Victoria. Wendu Vale, *Robertson;* Port Phillip, Melbourne, Dandenong Range, *F. Mueller* and others; French Island, *Beveridge;* Gipps' Land, *F. Mueller.*
Tasmania. Abundant, covering in some places large tracts of ground, *J. D. Hooker.*

3. **X. gracilis,** *Endl. in Pl. Preiss.* ii. 39.—Leaves crowded on the very short caudex, mostly about 2 ft. long and 2 to 2½ lines broad, flat or triquetrous, with broad dark bases. Scapes 2 to 3 ft. high, the spike from 2 to 5 in. long and 7 or 8 lines diameter when fully out, resembling that of *X. minor* except in the dark colour given to it by the rusty brown pubescence on the tips of the bracts and outer perianth-segments. Bracts oblong-linear or slightly spathulate, 2 to 2½ lines long. Outer perianth-segments as long as the bracts, obovate-oblong, with concave tips pubescent outside; inner segments with broad white spreading laminæ, about 1 line diameter, contrasting with the dark colour of the rest of the spike. Filaments longer than the perianth, at first erect, at length spreading; anthers shortly ovate.—F. Muell. Fragm. iv. 112.

W. Australia. Swan River, *Preiss, n.* 1619; Blackwood River and Cape Naturaliste, *Oldfield;* Perongerup, *F. Mueller,* the latter specimens remarkable for the spiral twist of the bunch of leaves.

4. **X. pumilio,** *R. Br. Prod.* 288.—Caudex not elongated. Leaves under 1 ft. long, very much recurved, flat, the dorsal midrib but slightly prominent, 1 to 2 lines broad. Scape under 1 ft. high, with a spike only about 1 in. long, oblong-cylindrical when in flower, ovoid-globular when in fruit, apparently glabrous, with the obtuse bracteoles and perianth of *X. arborea,* the flowers smaller than in any other species.

Queensland. Port Curtis, *R. Brown*, a diminutive species to which I have not seen any approach in any other collection.

5. **X. hastilis,** *R. Br. Prod.* 288.—Caudex very short or often scarcely prominent. Leaves 3 to 4 ft. long, 2 to 3 lines broad, flat in front but with the dorsal angle more or less prominent. Scape often 6 to 8 ft. long below the spike, which attains from $1\frac{1}{2}$ to 2 ft. but is not so thick as that of *X. arborea*, and readily known by the dense rusty tomentum covering the ends of the bracts and outer perianth-segments, especially conspicuous before the flowers expand. Bracts linear-spathulate, mostly very narrow. Outer perianth-segments about two lines long, oblong, 3- or 5-nerved, opaque, concave, scarcely acuminate, pubescent outside; inner ones very little longer, dilated hyaline and somewhat spreading at the end. Filaments only shortly exceeding the perianth. Full-grown fruiting spikes under 1 in. diameter without the capsules, which are about $\frac{1}{2}$ in. long, obtuse, protruding from the spike.—F. Muell. Fragm. iv. 113; Bot. Mag. t. 4722.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and several others.

The Flinders Island specimens "bracteis perianthiisque imberbibus" referred by Gunn in Hook. f. Fl. Tasm. ii. 59 to *X. hastilis*, must belong to some other species, but having no specimens it is impossible to identify it.

6. **X. arborea,** *R. Br. Prod.* 288.—Caudex growing out to several feet in height with a diameter of 6 to 9 in. Leaves as in *X. hastilis* flat or triquetrous, 3 to 4 ft. long and 2 to 3 lines broad. Scape under the spike attaining 5 or 6 ft. and the spike itself 3 to 4 ft. long, 1 to $1\frac{1}{2}$ in. diameter when full grown without the capsules. Bracts linear-spathulate, nearly as long as the perianth, quite glabrous or slightly ciliate at the tips. Perianth-segments about 3 lines long, 3-nerved, the outer ones concave at the end with a very short obtuse point, either quite glabrous or shortly and sparingly pubescent; inner ones scarcely longer, the dilated ends hyaline and slightly spreading. Stamens not much longer than the perianth. Capsule 7 to 8 lines long, more acuminate than in *X. hastilis*.

Queensland. Rockhampton, *O'Shanesy*, *Bowman* and others, with narrow leaves and the spike not so thick as in the Port Jackson specimens, but apparently the same species.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others.

7. **X. semiplana,** *F. Muell. Fragm.* iv. 111.—Caudex not elongated. Leaves long, about 3 lines broad and flat with the dorsal angle obtuse and but slightly raised in the lower part, tapering however into a narrow triquetrous point. Scape stout, about 2 ft. long, the spike about the same length, from $\frac{3}{4}$ to 1 in. diameter when in flower. Bracts linear, much acuminate. Perianth about 3 lines long, the outer segments obovate, concave at the end, scarcely or not at all acuminate, quite glabrous, the inner ones scarcely longer.

S. Australia. Lofty Range and Gawler River, *F. Mueller.* The leaves spike and flowers nearly those of *X. arborea*, but besides the caudex being undeveloped, the bracts or bracteoles surrounding the perianths are remarkably narrow and acuminate.

W. Australia ? Some specimens gathered by *F. Mueller* north of Stirling Range look more like this species than any other W Australian one, but are insufficient for satisfactory identification.

8. **X. bracteata,** *R. Br. Prod.* 288.—This has the narrow leaves and often the short spike of *X. minor*, but with the bracts or bracteoles and flowers nearer those of *X. semiplana.* Caudex very short. Leaves about 2 ft. long, 1 to $1\frac{1}{2}$ lines broad, concave on the upper side, the dorsal angle slightly projecting in the lower part, tapering upwards into a narrow triquetrous point. Scape 2 to 3 ft. high, the spike usually 4 to 6 in. long and little more than $\frac{1}{2}$ in. diameter, but in some larger specimens twice that length and $\frac{3}{4}$ in. diameter. Subtending bracts subulate and very conspicuous in the young spike, but most of them fallen away at the time of flowering or concealed by the outgrowing perianths. Bracts or bracteoles surrounding the flowers linear or linear-spathulate, distinctly acuminate, glabrous or with a tuft of a few hairs on their apex, all shorter than the perianth. Outer perianth-segments oblong, almost hoodshaped and acuminate at the top, scarcely $2\frac{1}{2}$ lines long; inner segments rather longer, their dilated hyaline ends slightly spreading but much less conspicuous than in *X. minor.* Fruit small.

N. S. Wales. Port Jackson, *R. Brown;* Paramatta, *Woolls.*

Queensland ? Some fruiting specimens in Herb. F. Mueller from between the Gilibrand and Barwan Rivers appear to belong to this species, others from Springsure have the subtending bracts prominent in the young spike, but not so long as in the typical *X. bracteata* and more lanceolate and the fruiting scape is said to be 1 in. diameter, the other characters being those of *X. bracteata.* Other more doubtful specimens from Newcastle Range, *F. Mueller*, and Whitsunday Island, *Henne*, have a similar foliage, but of the former leaves only have been preserved, of the latter there is a single very young spike in which the subtending bracts are short and triangular, though numerous and imbricate.

9. **X. australis,** *R. Br. Prod.* 288.—Caudex elongated but rarely exceeding 2 ft. Leaves about 2 ft. long, 1 to $1\frac{1}{2}$ lines broad, rather flat, but with the dorsal angle and sometimes also the facial one prominent. Scape usually about 2 ft. high and the spike when full grown rather longer and nearly $1\frac{1}{2}$ in. diameter. Subtending bracts subulate, very prominent in the young spike as in *X. bracteata*, but disappearing from the fully flowered spike. Bracteoles and outer perianth-segments glabrous, remarkably acuminate; inner segments not seen perfect, but from the withered remains probably not much exceeding the outer ones. Fruit obtuse, less protruded than in any other species.—Hook. f. Fl. Tasm. ii. 58, F. Muell. Fragm. iv. t. 110.

Victoria. Grass-tree plains of Curdie's River, granite rocks on Snowy River, and dry ridges on Hume River, *F. Mueller.*

Tasmania. Risdon Cove, *R. Brown;* north coast, *Gunn.*

10. **X. quadrangulata,** *F. Muell. Fragm.* iv. 111.—Caudex lengthening out to several feet. Leaves slender but rigid, 1½ ft. long, strictly 4-angular though sometimes slightly flattened, rarely above 1 line broad. Spike 3 or 4 ft. long on a scape at least as long or longer, 1½ in. thick when in flower. Bracts or bracteoles surrounding the flowers nearly as long as the outer perianth-segments, glabrous. Outer segments oblong-spathulate, concave or almost complicate, very shortly acuminate, quite glabrous; inner segments obtuse, about 3 lines long, 3- or 5-nerved, the whitish shortly flattened apex very little exceeding the outer segments. Stamens not much longer than the perianth. Fruit not seen.—Bot. Mag. t. 6075.

S. Australia. Mount Lofty and Barossa Ranges, *F. Mueller.*

11. **X. Preissii,** *Endl. in Pl. Preiss.* ii. 39.—Caudex thick and simple either very short or more or less elongated, attaining often 5 or 6 ft. and sometimes according to Oldfield as much as 15 ft. Leaves from a short broad flat base 2 to 4 ft. long, from scarcely above 1 line to nearly 2 lines broad, rigid, very brittle when young, mostly nearly flat on the inner face with the dorsal angle prominent so as to be acutely 3-angular, but sometimes the midrib raised on the inner face also so as to make them quadrangular as in *X. quadrangularis.* Scapes 2 to 6 ft. long including the spike which occupies from one half to nearly the whole length and when fully out is about 1 in. diameter. Subtending and outer-empty bracts ovate-oblong or lanceolate and prominent only on the very young spike; bracts or bracteoles surrounding the flowers linear-spathulate, nearly as long as the perianth, and often slightly ciliate at the end. Perianth-segments 3 to 3½ lines long, the outer ones thin, rigid, oblong, concave, 3- or rarely 5-nerved, the inner ones broader, with 5, 7 or even more nerves, with a very short spreading almost hyaline apex. Stamens twice as long as the perianth. Capsule 5 to 6 lines long.—*X. Brunonis,* Endl. in Pl. Preiss. ii. 39; *X. Drummondii,* Harv. in. Hook. Kew Journ. vii. 57; *X. pecoris,* F. Muell. Fragm. iv. 110.

W. Australia. Apparently common, from Stirling Range to the Vasse and Swan Rivers, *Drummond, Oldfield, Preiss, n.* 1620, 1621, *F. Mueller* and others.

I may be wrong in uniting the above supposed species but I am quite unable to distinguish them by the dried specimens. The leaves are often as quadrangular in the typical *X. Preissii* as in *Drummondii,* and the difference between the elongated and the short stem is accompanied by no other character that I can detect, and may possibly depend upon age.

5. DASYPOGON, R. Br.

Perianth persistent, 6-merous, dry or glumaceous, the 3 outer segments united in a tube, with 3 ovate lobes, the 3 inner free narrow, and not exceeding the outer. Stamens 6, hypogynous or scarcely adhering to the base of the perianth and longer than the segments; filaments rather thick; anthers oblong, entire at both ends, dorsally attached in the middle, the cells opening longitudinally. Ovary sessile

3-angled, 1-celled or imperfectly divided into 3 cells, with 3 ovules erect from near the centre of the cell, two of them often minute and abortive from the time of flowering; style subulate, with a small terminal stigma. Fruit 1-seeded globular and indehiscent, entirely enclosed in and almost adnate to the thickened and hardened tube of the outer perianth. Seed globular, erect; testa membranous; embryo linear, erect or nearly so, near the base of the fleshy but not hard albumen.—Long-lived perennials with a simple or slightly branched caudex, covered when old with the persistent sheath of old leaves. Leaves crowded at the apex of the caudex or base of the flowering stems, rarely extending higher up the stems, narrow-linear spreading and rigid. Flowers in globular heads on long terminal peduncles, each one sessile within a persistent bract without bracteoles.

The genus is limited to West Australia.

Caudex short and slender. Leafy stems including the peduncle 1 to 2 ft. Perianth with long slender very deciduous bristles . . . . 1. *D. bromeliæfolius.*
Caudex with the persistent sheaths 2 in. diameter and 2 to 6 ft. long. Perianth-tube hispid with short persistent bristles . . . . 2. *D. Hookeri.*

1. **D. bromeliæfolius,** *R. Br. Prod.* 263, *and in Flind. Voy.* ii. 608, *t.* 8. Stems from a hard rhizome several, erect or ascending, densely leafy at the base or for a length of from 6 in. to 1 ft. or more rarely when old leaving a slender caudex at the base not above ½ in. thick including the persistent leaf-sheaths. Leaves spreading, 6 in. to above 1 ft. long, 2 lines broad or more below the middle, tapering upwards to a fine point, rigid with the margins scabrous-denticulate, often twisted so as to be very oblique, expanded at the base into broad striate long-persistent sheaths; in some old specimens with the stems leafy for a considerable length the leaves are only 2 to 3 in. long. Peduncle terminal, 6 in. to 1 ft. long, very hispid with spreading or slightly reflexed bristles or rigid hairs, leafless or with a few distant small leaves. Flower-head dense, about 1 in. diameter, very hispid with the long bristles of the perianth, which however are usually very deciduous, leaving the fruiting head almost or quite glabrous. Bracts closely appressed, with broad bases shorter than the perianth, but the outer ones and sometimes some of the inner ones produced into long subulate points far exceeding the flowers. Perianths 3 to 3½ lines long, the outer segments united to nearly ¾ of their length; not much lengthened when in fruit, but thickened hardened smooth and shining; inner segments linear or linear-spathulate; slightly scarious on the edges.—F. Muell. Fragm. ii. 112; *D. glaber*, Laharpe in Mem. Soc. Hist. Nat. Par. iii. 101.

W. Australia. King George's Sound, *R. Brown*, *Drummond*, *n.* 205, eastward to Phillips River and Mount Barren, *Maxwell;* Swan River, *Preiss*, *n.* 1871, 1872.

D. obliquifolius, Lehm. in Pl. Preiss, ii. 52, is founded on old specimens of *D. bromeliæfolius*, with shorter leaves extending higher up the stem than in the ordinary state.

2. **D. Hookeri,** *Drumm. MS.; F. Muell. Fragm.* ii. 112.—Stem or caudex simple, erect, attaining many feet in old specimens, about 1 in. diameter, encased in the persistent sheaths of old leaves which thicken it to 2 in. diameter. Leaves very numerous at the end of the caudex, mostly above 1 ft. long, with broad imbricate sheathing bases. Scapes or peduncles as long as or longer than the leaves, densely scabrous with closely-reflexed short almost scale-like hairs. Flower-head globular and bracts similar to those of *D. bromeliæfolius*, but the tube of the outer perianth densely covered with short rigid erect or spreading almost paleaceous bristles, the lobes ovate and quite glabrous, without any of the long deciduous bristles of that species. Inner perianth stamens and ovary of *D. bromeliæfolius.*

W. Australia. Swan (or Vasse) River, *Drummond, Oldfield;* Vasse River, and Busselton, *Pries.*

TRIBE III.—CALECTASIEÆ.—Perianth-segments all rigid, sometimes coloured. Anthers erect. Style subulate, with a small terminal stigma. Flowers rather large.

6. KINGIA, R. Br.

Perianth persistent, of 6 distinct, erect, glumaceous segments, all similar and silky, hairy outside. Stamens 5, hypogynous or 3 slightly adhering to the base of the inner segments and all longer than the perianth; filaments filiform; anthers erect, linear, shortly 2-lobed at the base, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 1 erect ovule in each cell; style subulate with a minute terminal 3-toothed stigma. Fruit concealed amongst the persistent bracts and perianths, 3-angled, indehiscent. Seeds erect, often reduced to 1 by abortion, obovate; testa membranous; embryo only half included in the base of the fleshy albumen.—Long-lived plant with an erect wooden caudex. Leaves crowded at the summit of the stem, long and very narrow. Peduncles or scapes several, covered with loosely imbricate sheathing bracts. Flowers in a globular terminal head, each one sessile within a persistent bract.

The genus is limited to the single Australian species.

1. **K. australis,** *R. Br. in King. Voy.* ii. 535, *t.* c.—Caudex thick attaining sometimes many feet in height. Leaves 2 to 3 ft. long and only 1 to 2 lines broad in the greater part of their length, spreading or recurved, flat or more or less triquetrous, their edges usually serrulate, becoming glabrous when old, but dilated at the base into a loose sheath which remains densely silky-villous outside. Peduncles several from the tuft of leaves, 6 in. to 1 ft. long, covered with loosely imbricate broad sheathing bracts nearly 1 in. long besides their subulate points, the upper ones crowded and passing into the closely imbricate flowering bracts. Flower-head about 2 in. diameter, the bracts and perianths recurved at the end. Perianth-segments lanceolate, about ¾ in. long

when first out, but lengthening to 1 in. Anthers almost entirely exserted, scarcely broader than the filaments. Ovary and young fruit very densely villous, the ripe fruit only known from Brown's description.—Kunth, Enum. iii. 376; *K. australis* and *K. argentea*, Preiss, Endl. in Pl. Preiss. ii. 52.

W. Australia. King George's Sound, *R. Brown*, and thence to Swan River, *Drummond*, *Preiss*, *n.* 1526, 1527, *Oldfield*, *Harvey*.

7. BAXTERIA, Br.

Perianth persistent, of 6 equal erect long and narrow distinct segments. Stamens 6, attached to the base of the segments and shorter than them; filaments rigid, slightly flattened; anthers long and linear, erect, very shortly 2-lobed at the base, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 1 erect ovule in each cell; style subulate, rigid, with a small terminal stigma. Capsule obovoid, flat-topped, opening elastically in 6 valves, leaving the dissepiments attached to the axis, the rigid endocarp of each valve detached from the base upwards but remaining attached at the apex, horizontally closing the cells after the seed is ejected. Seeds globular (none remaining in the specimens I have seen.)—Flowers large, sessile and solitary in the centre of the dense tufts of long narrow leaves.

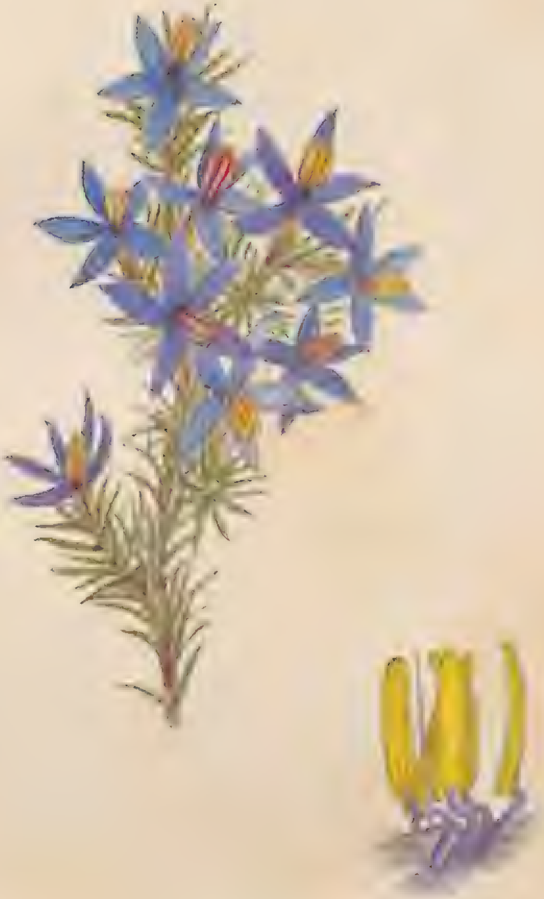
The genus is limited to the single species endemic in West Australia.

1. **B. australis,** *Hook. Lond. Journ.* ii. 492, *t.* 13 *to* 15.—Stock very short, woody, crowned by numerous tufts, of which some consist of leaves only which are erect, linear, 1 to 1½ ft. long, 2 to 3 lines broad in the middle, dilated at the base into broad striate sheaths, the flowering tufts have only 1 or 2 long leaves, passing into sheathing acuminate bracts the length of the perianth. Flowers sessile amongst the bracts, solitary in each tuft, the perianth segments fully 2½ in. long, not 2 lines broad in the greater part of their length, but dilated into broad imbricated bases. Anthers about 1 in. long and the rather longer filaments closely appressed to the inside of the segments. Capsule included in the somewhat enlarged broad bases of the segments; about ½ in. diameter when open.—Endl. in Pl. Preiss. ii. 52.

W. Australia. King George's Sound and to the eastward, *Baxter*, *Drummond* *n.* 303 *and* 464, *Preiss*, *n.* 1525.

8. CALECTASIA, R. Br.

Perianth persistent, hypocrateriform, the tube cylindrical or slightly dilated upwards, the limb of 6 spreading nearly equal lanceolate rigid but coloured lobes. Stamens 6, inserted at the base of the lobes and shorter than them; filaments shortly filiform; anthers linear, erect, shortly lobed at the base, the cells opening in terminal pores, sometimes



continued in longitudinal slits. Ovary contracted into a very short stipes, narrow, 1-celled, with 3 ovules erect from the centre of the cell; style filiform, with a small terminal stigma. Fruit 1-seeded, oblong or fusiform, indehiscent, enclosed in the slightly hardened tube of the perianth. Pericarp membranous, several-nerved except the smooth apex. Seed oblong with a membranous testa; embryo small, near the base of the fleshy albumen.—Stems woody but slender, branched, covered with leaf-sheaths. Leaves small, linear-subulate. Flowers singly sessile at the ends of the short branches, surrounded by leafy bracts.

The genus is limited to the single Australian species.

1. **C. cyanea,** *R. Br. Prod.* 261, *and in Flind. Voy.* ii. 609, *t.* 9.—Stems usually clustered, erect or ascending, flexuose with short often numerous branches, mostly about 1 ft. high, covered with the sheaths of old leaves, the whole plant more or less pubescent or almost glabrous. Leaves crowded on the short branches, linear-subulate, very acute or pungent-pointed, 4 to 8 lines long, almost 3-quetrous towards the end, flatter below the middle, the persistent sheaths closely embracing the stem, the upper ones passing into the floral bracts. Flowers terminal solitary and sessile. Perianth-tube closely encased in sheathing bracts, shorter than the lobes, almost always pubescent at the base and sometimes all over; lobes blue, often turning reddish-brown in drying, varying from under 4 lines to above 6 lines in length, lanceolate rigid and horizontally spreading both during and after flowering, when old losing their colour or turning brown especially along the centre. Perianth-tube slightly thickened when in fruit, but the flower not otherwise enlarged.—Endl. Iconogr. t. 38 (not quite correct as to the stamens); Walp. Ann. vi. 156; *C. grandiflora*, Preiss in Pl. Preiss. ii. 53; *C. intermedia*, Sond. in Linnæa, xxviii. 222.

Victoria. Grampians, *F. Mueller, Sullivan;* Wimmera, *Dallachy;* Tattiara country, *Woods;* heath west of Glenelg River, *Robertson.*

S. Australia. Robe town, *Herb. F. Mueller.*

W. Australia. Apparently very abundant from King George's Sound to Vasse, Swan, and Murchison Rivers, *R. Brown, A. Cunningham, Drummond, 1st. coll. and n.* 446, 779, *and* 780, *Preiss, n.* 1974 *and* 1975, and many others; eastward to Cape Paisley, *Maxwell.*

The species varies very much, in the leaves very short and appressed or much longer and spreading, in the pubescence sometimes confined to the base of the perianth-tube or a little on the back of its lobes, generally rather more copious about the flower, and in some specimens soft and dense over the whole plant, and especially in the size of the flowers. In some northern specimens the lobes are scarcely above 3 lines long and almost obtuse, in the generality of southern and eastern ones, the lobes are 5, 6 or even 7 lines long and very acute, but in a large series of specimens it is impossible to mark out three distinct varieties or species as proposed by Sonder.

TRIBE IV. ENJUNCEÆ.—Perianth small, the segments all free and glume-like. Anthers erect. Style with 3 linear stigmatic branches. Leaves grass-like or terete, mostly radical, or none.

9. LUZULA, DC.

Perianth of 6 equal glume-like segments. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them, all shorter than the perianth; filaments filiform; anthers oblong or linear, erect, emarginate at the base. Ovary sessile, 1-celled, with 3 ovules erect from a very short central placenta; style single, with 3 usually long and slender stigmatic lobes. Capsule 3-valved. Seeds 3 or fewer by abortion, erect, the very short central placenta usually connected with a slightly raised line in the centre of each valve, globular or ovoid, the testa minutely reticulate-striate with a very thin external hyaline membrane connected with the somewhat dilated funicle and sometimes shortly produced beyond the seed. Embryo small, near the hilum, in an indenture of the almost farinaceous albumen.—Perennial herbs, usually tufted. Leaves grass-like, chiefly radical, often fringed with long fine white hairs. Flowers clustered or distinct, the clusters in irregular unequally branched compound umbels or panicles sometimes contracted into heads, each flower subtended by a scarious bract and enclosed at the base in 1 or 2 broad short scarious bracteoles.

The genus, nearly allied to *Juncus*, is similarly spread over the greater part of the globe, chiefly abundant in temperate regions and more common in woods and pastures than in marshes. Of the three Australian species or varieties, one is cosmopolitan, the two others are endemic, at least in the precise Australian form.

Perianth-segments very acute, 1 to 1½ lines long.
  Leaves 2 to 4 lines broad, with prominent nerve-like margins. Flower-clusters in a dense head above ½ in. diameter . . . . 1. *L. Oldfieldii.*
  Leaves rarely above 2 lines broad, the nerve-like margins not very prominent. Flower-clusters pedunculate or if all sessile the head scarcely ½ in. diameter . . 2. *L. campestris.*
Perianth-segments subulate-acuminate, 2 to 2½ lines long . 3. *L. longiflora.*

1. **L. Oldfieldii,** *Hook. f. Fl. Tasm.* ii. 68.—Considered by F. Mueller as a variety of *L. campestris*, but can scarcely be joined with it unless that species be made to include the northern *L. spicata* as well as the South American *L. peruviana* and others generally admitted as distinct. Habit of the compact forms of *L. campestris*, but the tufts more dense and the leaves themselves much broader, varying from 2 to 4 lines, with the nerve-like margin very prominent. Inflorescence very compact, more or less compound, forming an ovoid or almost globular slightly lobed head of ½ to ¾ in. diameter. Perianth-segments very acute, the size of those of *L. campestris* or rather longer. Seeds rather ovoid than globular.

Tasmania. Summit of Mount Wellington, *Oldfield*; a New Zealand plant almost identical with it is referred to the same species by J. D. Hooker.

L. australasica, Steud. Syn. Glum. ii. 294, from Australia, *Durville*, is unknown to me; from the diagnosis given it may be the compact flowering form of *L. campestris*, or, from his comparing it to *L. chilensis*, more probably the same as *L. Oldfieldii.*

2. **L. campestris,** *DC.; Kunth, Enum.* iii. 307.—Stock usually tufted and often knotted with the short hardened bases of the leaves. Stems from a few inches to above 1 ft. high, with a tuft of radical grass-like leaves 2 to 4 in. long, rarely above 2 lines broad, usually bordered by long fine white hairs, and often one leaf higher up, besides a long leafy bract under the inflorescence terminating the stem. Flowers in dense clusters, of which usually 1 or 2 sessile or almost sessile, surrounded by several others on peduncles varying from $\frac{1}{2}$ to 1 in., but sometimes all the clusters collected into a sessile pyramidal head. Bracts shorter than the flowers, usually shining white and contrasting with the brown perianth. Perianth-segments very acute, 1 to $1\frac{1}{2}$ lines long, dark or light brown and often with scarious margins. Capsule very obtuse, not exceeding the perianth.—R. Br. Prod. Addend.; Hook. f. Fl. Tasm. ii. 68; E. Mey. in Pl. Preiss. ii. 48.

Queensland. Armidale, *Parrott.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Moore;* Clarence River, *Beckler;* in the interior, *Mitchell*, *M'Arthur.*

Victoria. From Wendu Vale, *Robertson*, Portland, *Allitt*, Melbourne, *Adamson*, *F. Mueller* and others, to Genoa River and the Australian Alps generally, *F. Mueller;* Wimmera, *Dallachy.*

Tasmania. Derwent River, *R. Brown;* abundant in pastures throughout the island ascending to 3000 ft., *J. D. Hooker.*

S. Australia. Encounter Bay and ranges around St. Vincent's Gulf, *F. Mueller.*

W. Australia. From near King George's Sound to Swan and Murchison Rivers, *Drummond, n.* 66 *and* 337, *Preiss, n.* 1805, *Oldfield* and others.

This exceedingly variable species, especially in the compactness or looseness of the inflorescence, extends over the temperate or mountain regions of a great part of the globe.

3. **L. longiflora,** *Benth.*—Habit of the luxurious leafy forms of *L. campestris.*—Leaves grass-like, 6 in. to 1 ft. long, the marginal nerve scarcely prominent. Inflorescence as in *L. campestris* compound, the clusters or heads usually rather numerous, more or less pedunculate, or all collected into a compound head of more than 1 in. diameter, surrounded usually by several long leafy bracts. Bracts under the flowers scarious and entire. Perianth-segments subulate-acuminate, 2 to $2\frac{1}{2}$ lines long and 2 or 3 times as long as the capsule.

N. S. Wales. Lord Howe's Island; summit of Mount Lingbird, *C. Moore;* summit of Mount Gower, *Fullagar.* The species is allied to the New Zealand *L. crinita*, but the perianth is much longer than in that or any other species of the genus.

10. JUNCUS, Linn.

Perianth of 6 equal glume-like segments. Stamens either 6, 3 attached to the base of the inner segments and 3 alternate with them, or fewer 1, 2 or all 3 of the inner ones deficient, filaments filiform; anthers oblong or linear, erect, emarginate at the base or almost entire.

Ovary sessile, with 3 parietal placentæ sometimes scarcely prominent, more frequently protruding and sometimes meeting or even connate in the centre, dividing the ovary more or less perfectly into 3 cells; ovules several usually numerous to each cell; style divided usually to the middle into 3 linear or filiform stigmatic lobes often spirally twisted. Capsule 3-valved, the valves usually bearing the placentæ in their centre, or rarely the linear placentæ becoming detached and remaining distinct or cohering in a central column. Seeds very small, usually ovoid, the testa minutely striate-reticulate, with a very thin transparent outer membrane, often scarcely distinct from the testa, but sometimes produced at the end of the seed into a terminal loose appendage often called a tail. Embryo small, near the hilum.—Perennial or rarely annual herbs, the stems usually tufted or crowded on a creeping rhizome. Leaves mostly or all radical, grass-like or terete or sometimes all reduced to sheathing scales. Flowers small in little dense clusters or forked cymes, the clusters or cymes usually several or many, either sessile or nearly so in a dense head, or unequally pedunculate in a simple or branched irregular panicle, really terminating a simple leafless scape with 1, 2 or 3 leafy bracts at the base, but sometimes the inflorescence appears lateral, the bract being terete, but little dilated at the base and strictly erect, forming an apparent continuation of the stem.

The genus is very generally spread over almost all known parts of the world, most abundant in temperate or cool regions, in marshes, maritime sands or wet mountains, but found also in similar situations within the tropics. It is very difficult to decide upon the limits to be assigned to some of the common cosmopolitan species, but taking those limits to be such as here adopted, of the 14 Australian ones, 3 are undoubtedly cosmopolitan, 2 extend to New Zealand and 1 of these also to extra-tropical South America, a 6th cannot be distinguished from a Californian species, a 7th appears to be the same as one from the Mediterranean region, the 7 remaining ones have not as yet been identified with extra-Australian ones, but they may not all prove to be really endemic.

Leaves grass-like and flat or rarely almost terete. Inflorescence terminal with spreading bracts.
Flowers brown, few or many in close clusters.
Stems filiform, leafy for several inches. Flower-heads very small, paniculate. Ovules and seeds few . . 1. *J. gracilis.*
Leaves all radical. Ovules and seeds numerous.
Flower-clusters paniculate (habit of *Luzula*).
Leaves mostly 1 to 3 lines broad. Stamens 3 . . 2. *J. planifolius.*
Leaves rarely above 1 line broad. Stamens 6 . . 3. *J. cæspititius.*
Flower-clusters collected in a dense terminal head. Stamens 6 . . . . 4. *J. falcatus.*
Flowers pale-coloured, in loose cymes or in clusters of 2, 3 or rarely more. Stems under 1 ft. high.
Annual. Flowers mostly distinct, in a much-branched leafy panicle . . . . 5. *J. bufonius.*
Tufted perennial. Flowers clustered (2 to 6), in a slightly branched leafy panicle . . . . 6. *J. homalocaulis.*
Perennial with a creeping rhizome. Flowers distinct in an irregularly dichotomous cyme . . . . . 7. *J. revolutus.*
Leaves terete or nearly so or reduced to sheathing scales.
Panicles apparently lateral below the end of rigid leaf-

less stems (the subtending leafy bract erect and continuing the stem).
Leaves and terminal bract not jointed.
Filaments filiform. Seeds not tailed.
Stamens 3. Scales at the base of the stem usually short.
Flowers distinct in the panicle . . . . 8. *J. communis.*
Flowers all collected into distinct clusters . . . 9. *J. vaginatus.*
Stamens 6. Scales at the base of the stem short or longer than in *J. communis.* Flowers small, distinct in the panicle . . . . 10. *J. pauciflorus.*
Stems very stout and tall with long loose scales at the base. Flowers rather large, distinct in the panicle. Stamens varying 3 to 6 . . . . . . 11. *J. pallidus.*
Filaments short and flat. Seeds tailed. Stems very rigid. Stamens 6 . , ... 12. *J. maritimus.*
Leaves and terminal bracts appearing jointed from internal cross partitions of pith.
Stems more or less flattened usually 1–2 ft. Perianth-segments 1½ lines with long subulate points. Stamens usually 4 . . . . 13. *J. prismatocarpus.*
Stems 2–7 in. Flower-clusters small and few. Perianth-segments 1 line long, lanceolate, rather acute . . . . 14. *J. capillaceus.*

J. dioicus, Steud. Syn. Glum. ii. 309, from King George's Sound, is insufficiently described for identification, and may not be a *Juncus* at all.

1. **J. gracilis,** *R. Br. Prod.* 259.—Stems filiform, above 1 ft. high, densely tufted at the base although each tuft is never above 2 lines diameter, leafy for several inches, the lower withered leaves having persistent sheaths. Leaves flat and grass-like but very narrow almost filiform, much shorter than the stem. Flowers small, brown, few together (5 to 10 or sometimes only 2 or 3), in little globular clusters sessile at the base of the ramifications of a terminal irregular cyme or at the ends of the filiform very unequal branches, with 1 subulate leafy bract under the inflorescence, the bracts under the clusters and flowers minute. Perianth-segments under 1 line long, the outer lanceolate, the inner ovate. Stamens varying from 3 to 6; filaments filiform; anthers rather long. Ovary completely 3-celled, the placentæ meeting in the centre and apparently cohering, with several but not numerous ovules in each cell. Capsule obtuse, as long as or rather longer than the perianth, the valves bearing the placentæ without leaving a central column. Seeds usually only 1 or 2 in each cell, nearly globular, striate, the funicle rather long.

W. Australia. King George's Sound, *R. Brown*, and probably the same district, *Drummond, n.* 103.

Var. *humilis.* Stems under 6 in. high, the inflorescence reduced to very few or sometimes to a single cluster.—Karri Dale, *Walcot.*

2. **J. planifolius,** *R. Br. Prod.* 259.—Stock tufted. Leaves radical, usually numerous, flat and grass-like, shorter than the stem, 1 to 3 lines or rarely nearly 4 broad, with long imbricating sheaths almost

distichous, the whole habit nearly that of some varieties of *Luzula campestris*. Stems leafless, usually 1 to 1½ ft. high, but sometimes much lower, with a terminal compound unequally branched cyme, the lower branches often clustered. Bracts all small and scarious, or rarely 1 or 2 leafy ones at the base of the inflorescence. Flowers brown, in globular clusters at the base of the ramifications and ends of the branches. Perianth-segments but little more than 1 line long, very acute. Stamens 3. Ovary with 3 parietal placentæ only very shortly connected at the base and numerous ovules. Capsule mucronate or scarcely acuminate, about as long as the perianth. Seeds ovoid, very small, the minute reticulations visible only under a ¼ in. lens.—Hook. f. Fl. Tasm. ii. 64.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Woolls* and others; New England, *C. Stuart;* Macleay River, *C. Moore.*
Victoria. Port Phillip, *F. Mueller;* Wimmera, *Dallachy.*
Tasmania. Table Mountain (Mount Wellington), *R. Brown;* abundant throughout the island, *J. D. Hooker.*
S. Australia. Lofty ranges and others round St. Vincent's Gulf, *F. Mueller.*
W. Australia. King George's Sound and neighbouring districts, *Maxwell*, *F. Mueller*, *Drummond*, *n.* 208, 366, and others.

Var. *tenella.* Stems mostly under 6 in., very slender, with very narrow leaves. Flower-heads small with few flowers, but not so small as in *J. gracilis.* Flowers triandrous and capsules shortly mucronate as in the typical *J. planifolius.*—Mount M'Ivor, *F. Mueller.*

3. **J. cæspititius,** *E. Mey. in Pl. Preiss.* ii. 47 *and in Linnæa* xxvi. 214.—The larger specimens sometimes much resemble *J. planifolius*, but the leaves are always much narrower and the stamens appear to be constantly 6. Leaves usually densely tufted, the broadest but little more than 1 line or in very luxuriant specimens a few of them nearly 2 lines broad just above the sheath, all more erect than in *J. planifolius*, usually convolute towards the end and often almost subulate. Stems rarely much above 1 ft. high. Inflorescence when much developed the same as in *J. planifolius*, but the flowers rather larger, the inner segments entirely excluding the outer before expansion and enclosing the 6 stamens. Placentas parietal with numerous ovules, and seeds tailless and smooth unless under a high power as in *J. planifolius.* Capsule rather shorter than the perianth and almost obtuse.—Hook. f. Fl. Tasm. ii. 64.

Victoria. Wendu Vale, *Robertson;* Snowy River, *F. Mueller.*
Tasmania. In the northern parts of the island, *J. D. Hooker.*
S. Australia. St. Vincent's Gulf, *F. Mueller.*
W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 336, 937; *Preiss, n.* 1733 Murchison River, *Oldfield.*

4. **J. falcatus,** *E. Mey. Syn. Luzul.* 31, *and in Linnæa*, xxvi. 215.—Rhizome stoloniferous. Leaves at the base of the stem flat, grass-like, shorter than the stem, mostly 1 line broad or rather more. Stems 6 in. to 1 ft. high, bearing usually 1 leaf at or above the middle and a single

terminal head of flowers surrounded by scarious bracts, or rarely a second head lower down in the axil of a leafy bract. Flower-head (composed of condensed cymes) usually 3 to 4 lines diameter when in flower, twice that when in fruit, the scarious bracts all shorter than the flowers or rarely the outermost one produced into a leafy point. Perianth-segments brown, about 2 lines long, the outer ones very acute, the inner less so. Stamens 6. Placentas parietal, with many ovules. Capsule obtuse, about as long as the perianth, dark and shining. Seeds obovoid or oblong, brown, obtuse or rarely with a very small white apiculus, marked with numerous fine longitudinal reticulations.—Hook. f. Fl. Tasm. ii. 64; Engelm. in Trans. Acad. Sc. St. Louis, ii. 452, 495; *J. agrostophyllus*, F. Muell. in Linnæa, xxvi. 245.

Victoria. Snowy River, Mitta-Mitta, Cobberas and other ranges of the Australian Alps, *F. Mueller.*

Tasmania. On all the mountainous parts in wet places, *Gunn*, *Archer* and others.

E. Meyer originally described the species from Californian specimens with which he afterwards identified the Australian ones. Engelmann had in the first instance distinguished the latter under the name of *J. tasmanicus*, chiefly from some slight difference in the reticulation of the seeds which he subsequently recognised as not of specific importance. In the specimens I have examined I find the seeds generally narrower and the transverse lines connecting the longitudinal ones fewer and less prominent in the Californian than in the Australian ones, but sometimes there is more difference in the seeds of 2 capsules from the same country than in others from 2 capsules of the 2 countries.

5. **J. bufonius,** *Linn.; Kunth, Enum.* iii. 353.—A pale-coloured tufted annual, rarely exceeding 6–8 in. and often scarcely half that size, the stems erect, slender and branching, with a linear leaf or leafy bract under each branch. Leaves linear, from almost filiform to nearly 1 line broad, the margins involute at least in the dried state, the lower ones sometimes exceeding the stem, all dilated at the base into a rather long sheath. Flowers nearly sessile, solitary or in clusters of 2 or 3, terminal or sessile in the forks of a loose dichotomous leafy cyme. Bracts broadly ovate, thinly scarious, subtending each flower with 2 similar bracteoles immediately under the perianth. Perianth-segments pale coloured, narrow, acuminate and very acute, mostly about 3 lines long, but variable in size, the inner ones rather smaller than the outer. Stamens 6 or rarely only 3. Capsule oblong, shorter than the perianth, the placentas usually at length detached from the valves and either cohering in a central column or ultimately separating. Seeds minute and numerous, without tails.—E. Mey. in Pl. Preiss. ii. 47; Hook. f. Fl. Tasm. ii. 64; *J. plebeius*, R. Br. Prod. 259.

N. S. Wales. Port Jackson, *C. Moore*, *Woolls*, and others.

Victoria. Wendu Vale, *Robertson;* about Melbourne, *Adamson*, *F. Mueller* and others; Wimmera, *Dallachy*.

Tasmania. Abundant in moist places throughout the colony, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf to Rivoli Bay, and the Murray, *F. Mueller*, *Behr*.

W. Australia. King George's Sound to Swan and Murchison Rivers, *Drummond*, *Oldfield*, *Preiss*, *n.* 1734, and others.

The species is a common weed in most temperate regions of the globe.

6. **J. homalocaulis,** *F. Muell. in. Herb. Hook.*—A small tufted pale-coloured species apparently perennial, but without the creeping rhizome of *J. revolutus*. Stems rarely exceeding 6 in., slender, the inflorescence but little branched. Leaves from the base of the stem very narrow and almost terete and shorter than the stem. Flowers 2 to 6 together in clusters or heads sessile or pedunculate towards the end of the stem, with a subulate leafy bract under the lowest cluster, the flowers sessile in the clusters and generally divaricate, at least after flowering and the clusters few to each stem. Perianth-segments rigid, acutely acuminate, about 3 lines long, the inner ones rather shorter. Stamens 6. Style divided nearly to the base. Placentas parietal, not very prominent. Capsule rather shorter than the perianth. Seeds ovoid, without tails.—*J. plebeius*, Steud. Syn. Glum. ii. 307 and some others, but not of R. Br.

N. S. Wales. Port Jackson, *C. Moore*, *Woolls;* New England, *C. Stuart.*
Victoria. Glenelg River, *Robertson;* Black Forest, *F. Mueller;* Wimmera, *Dallachy.*

This was supposed to have been the *J. plebeius* of Brown and is united by F. Mueller with the *J. revolutus* under the name of *J. Brownei.* It appears to me however to be quite distinct in habit as well as in inflorescence from that species, and to approach nearer to *J. bufonius*, to which *J. plebeius* proves to be referrible.

7. **J. revolutus,** *R. Br. Prod.* 259.—Stems from a creeping rhizome erect, simple below the inflorescence, from 2 or 3 in. to nearly 1 ft. high. Leaves mostly shorter than the stem, all from its base or a single one higher up, all very narrow, the midrib prominent underneath and the thickened margins often recurved especially towards the end. Flowers singly sessile along the branches or in the forks of an irregularly branched terminal dichotomous cyme, with 1 or 2 leafy bracts at the base of the cyme, small glumaceous ones under the forks, and short broad almost scarious ones under each flower. Perianth-segments narrow, pale-coloured, acute, thick and rigid, with scarious margins, 2½ to nearly 3 lines long. Stamens 6. Placentas parietal, prominent but not uniting with each other except at the very base. Capsule obtuse, shining, as long as the perianth or rather shorter. Seeds ovoid, without tails.—Hook. f. Fl. Tasm. ii. 65; *J. Brownei*, F. Muell. in Linnæa, xxvi. 245, Fragm. ix. 78, partly.

Victoria. Yarra and Snowy Rivers, *F. Mueller.*
Tasmania. Port Dalrymple, *R. Brown;* near the sea, Georgetown, *Gunn;* on the Tamar, *C. Stuart.*

8. **J. communis,** *E. Mey. Syn. Junc.* 12.—Stems densely tufted on a horizontal or shortly creeping matted rhizome, usually 2 to 3 ft. high, or even more, erect, terete, leafless except a few brown or pale-

coloured leafy sheathing scales at the base. Panicle apparently lateral and sessile at from 2 or 3 to 6 or 8 in. below the top, the leafy bract at the base of the inflorescence being erect, terete, continuous with the stem, and scarcely hollowed into a sheath at the base. Flowers numerous, densely crowded into a compact globular head of $\frac{1}{2}$ in. diameter or forming a looser very unequally branched panicle of 1 to 2 in. diameter flowering from the base, the central short branches having only 2 or 3 flowers, the others a considerable number, usually singly scattered along the branches of irregular cymes. Bracts within the panicle small and scarious. Perianth nearly or quite sessile, the segments all very acute, usually pale-coloured, above 1 line and under $1\frac{1}{2}$ lines long. Stamens in all the flowers examined 3 only, alternating with the inner segments. Capsule narrow-ovoid or elliptical, obtuse, as long as or rather longer than the perianth. Placentas very prominent and often meeting in the centre but not united except at the base. Seeds very numerous, minute, without tails.—Hook. f. Fl. Tasm. ii. 67 ; *J. effusus*, Linn. ; R. Br. Prod. 258.

Australia. Apparently abundant wherever there are marshes or habitually wet places, especially without the tropics, the special localities recorded from each colony are far too numerous to be worth enumerating, the species extending also to most temperate and sub-tropical regions of the globe. In Australia as elsewhere there are two principal varieties, the *J. conglomeratus*, Linn., with the flowers closely packed in a dense head and usually more or less brown, and *J. effusus*, Linn., with the panicles looser and paler coloured, but every gradation may be observed between the two. The former is not so common in Australia as the looser flowered one, but I have seen specimens from all the colonies in the herbaria of F. Mueller or of Kew.

J. australis, Hook. f. Fl. Tasm. ii. 66, t. 134, and *J. pallidus*, Hook. f. l. c. and probably Kunth, Enum. iii. 321, but not of R. Br., appear to me to be entirely referrible to forms of *J. communis*.

9. **J. vaginatus,** *R. Br. Prod.* 258.—This has the stems with sheathing scales at the base and the continuous terete terminal leafy bract of *J. communis*, but the panicle is looser with rather long branches, and the flowers in little dense distinct cymes almost contracted into clusters at the base of the ramifications and ends of the branches, almost as in *J. prismatocarpus*. Perianths small and stamens 6 as in *J. pauciflorus*.

N. S. Wales. Port Jackson, *R. Brown*. I have seen it in no other collection. The southern and western large species usually taken for Brown's *J. vaginatus* is his *J. pallidus*.

10. **J. pauciflorus,** *R. Br. Prod.* 259.—Stems in the typical form crowded on a horizontal or shortly creeping rhizome and under 1 ft. high, but attaining in other specimens 2 or 3 ft., leafless except a few sheathing scales at the base, of which the innermost is often several inches long and sometimes produced into a leafy point of 1 or 2 in. Inflorescence lateral as in *J. communis*, the leafy bract at its base terete and continuous, erect and terminating the stem. Panicle irregularly compound resembling that of the loose-flowered varieties of *J. communis*,

but usually more slender, the flowers few or numerous rather smaller than in that species, and six stamens in all the flowers examined. Ovary, capsule, and seeds of *J. communis.*—Hook. f. Fl. Tasm. ii. 67.

Queensland. Moreton Bay, *F. Mueller*, and others; Rockhampton, *Thozet.*

N. S. Wales. Port Jackson, *R. Brown*, *Woolls* and others; Macleay River, *Beckler*, *C. Moore;* Richmond River, *Mrs. Hodgkinson;* New England, *C. Stuart.*

Victoria. From Portland, *Green*, and Mount William, *Sullivan*, to the Baw-Baw and Cape Otway ranges and Snowy River, *F. Mueller.*

Tasmania, *R. Brown;* abundant throughout the colony, *J. D. Hooker.*

S. Australia. Ranges bordering St. Vincent's Gulf and Torrens River, *F. Mueller* and others.

J. Gunnii, Hook. f. Fl. Tasm. ii. 67, appears to me to be a slight variety of *J. pauciflorus*, of small size, with dark brown bracts and perianths, which are usually but not always very pale in the typical forms.

11. **J. pallidus**, *R. Br. Prod.* 258.—A tall stout species, very nearly allied to the loose-flowering varieties of *J. communis.* Stems several feet high, the sheathing scales enclosing their thick base long and loose, the innermost often 6 to 10 in. long and tapering into a long point. Inflorescence lateral like that of *J. communis*, but more rigid and the flowers usually rather longer. Stamens usually 3, but occasionally varying to 4 or 5 and perhaps sometimes 6.—*J. vaginatus*, E. Mey. in Pl. Preiss. ii. 46; Hook. f. Fl. Tasm. ii. 68, not of R. Br.; *J. correctus*, Steud. Syn. Glum. ii. 296.

Queensland. Plains of the Condamine, *Leichhardt.*

N. S. Wales. A few specimens from various collections as well as the above-mentioned plant of Leichhardt's appear to be referrible to this species, but are somewhat doubtful.

Victoria. French Island, *Beveridge;* Ararat, *Green*, and a few other stations.

Tasmania. Common in many parts of the island, both north and south, *J. D. Hooker.*

S. Australia. In numerous localities about St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. King George's Sound, *R. Brown*, and thence to Swan River, abundantly, *Drummond, n.* 319 *and* 367, *Preiss, n.* 1864, and many others.

The four preceding species might be regarded as varieties of one, which however in that case should include many forms from other countries generally adopted as distinct species.

12. **J. maritimus**, *Lam.; Kunth, Enum.* iii. 322.—Stems densely tufted on a horizontal or shortly creeping rhizome, very rigid, 2 to 3 feet high, with sheathing scales at the base, of which 1 or 2 inner ones terminate in a rigid terete pungent stem-like leaf shorter than the real stems. Panicle or cyme appearing lateral, the long outer leaf-like bract erect and continuing the stem but more distinct than in *J. communis*, owing to its broad sheathing base. Flowers in little clusters usually very numerous in an irregularly

compound panicle sometimes very dense, sometimes looser with 1 or 2 of its branches elongated to several inches. Perianth-segments about 1¼ lines long, the outer ones very acute, the inner with broad scarious margins. Stamens 6, the filaments short and broad. Capsule not exceeding the perianth, almost completely 3-celled. Seeds oblong, variable in size and number, the outer membrane almost always produced at both ends into short tails.—R. Br. Prod. 258; E. Mey. in Pl. Preiss. ii. 46; Hook. f. Fl. Tasm. ii. 66.

Queensland. Rockhampton, *O'Shanesy* and others.
N. S. Wales. Paramatta, *Woolls;* Hastings River, *Beckler.*
Victoria. Melbourne, *Adamson;* Gipps' Land, *F. Mueller.*
Tasmania. Common in salt and brackish marshes, sometimes on moist sand hills, *J. D. Hooker.*
W. Australia. King George's Sound and Lucky Bay, *R. Brown,* thence to Swan River, *Drummond, n.* 194, 339; *Preiss, n.* 1865, *Oldfield.*

The species is common in maritime marshes and moist sands in most temperate regions. The flowers in the Australian specimens are usually rather smaller and darker coloured and the inflorescence more dense than in the northern ones. Drummond's n. 338 is a remarkably large stout form, with the stem and leaves nearly 2 lines diameter and the base of the stem with its sheaths 4 to 5 lines diameter, but the flowers and fruits those of the typical *J. maritimus.*

In Herb. F. Mueller are two imperfect specimens of the northern *J. acutus,* labelled as from Sieber's Australian collection, but probably by some error. They have not Sieber's printed labels, and no other specimens from the southern hemisphere are known.

13. **J. prismatocarpus,** *R. Br. Prod.* 259.—Stems tufted or stoloniferous and shortly creeping at the base, 1 to 2 ft. high, more or less compressed. Leaves few, erect from long sheaths, compressed or nearly terete, hollow inside but divided by cross partitions of pith giving them a jointed appearance. Panicle terminal, erect, compact or divaricate with long branches, with 1 or 2 erect leafy bracts at its base, jointed like the leaves. Flowers numerous in globular clusters terminating the branches or sessile at their base. Perianth-segments very narrow, with subulate points, about 1½ lines long, the inner ones rather broader. Stamens usually 3, but sometimes 4 to 6, the filaments slender. Capsule narrow, with very prominent acute angles, from a little shorter to considerably longer than the perianth, the parietal placentæ scarcely prominent inside. Seeds minute, without tails.—*J. holoschœnus,* R. Br. l. c.; Hook. f. Fl. Tasm. ii. 65; *J. commutatus,* Steud. Syn. Glum. ii. 301.

Queensland. Moreton Bay, *Eaves;* Armidale, *Perrot;* Broad Sound *Gulliver.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 431 and many others; New England, *C. Stuart;* Macleay River, *C. Moore;* Clarence River, *Beckler, Wilcox.*
Victoria. Wendu Vale and Glenelg River, *Robertson;* Melbourne, *F. Mueller.*
Tasmania. Abundant in marshy places throughout the island, *J. D. Hooker.*
S. Australia. St. Vincent's Gulf, *Behr, F. Mueller* and others.
W. Australia. King George's Sound to Swan and Murchison Rivers, *Drummond, n.* 54, 114, 233, 323, *Oldfield* and others.

J. striatus, Schousb. from the Mediterranean regions is scarcely distinguishable from *J. prismatocarpus* except by the rather smaller flowers, and *J. oxycarpus*, E. Mey. from South Africa appears to be quite identical.

14. **J. capillaceus,** *Hook. f. Fl. Tasm.* ii. 65, *t.* 134.—Stems from a tufted or shortly creeping branching base erect, leafy, only 2 to 3 in. high. Leaves very narrow or subulate, nearly terete, more or less distinctly divided inside by cross partitions of pith as in *J. prismatocarpus*, sometimes shorter than but often twice as long as the stem. Flowers in little clusters of 3 to 10, rarely reduced to single flowers, and often not above 3 or 4 clusters to the small panicle, the lowest bract usually elongated and leafy, the other bracts small. Perianth-segments about 1 line long, lanceolate with scarious margins, rather acute but without the subulate points of *J. prismatocarpus*. Stamens 6. Capsule as long as or shortly exceeding the perianth, obtusely angular and shortly beaked. Placentas scarcely prominent. Seeds without tails.

N. S. Wales. Timbarra, New England, *C. Stuart.*

Victoria. Rivulets of the Black Mountains and Cobra Range, ascending to 5 or 6000 ft. *F. Mueller.*

Tasmania. Arthur's Lake, *Gunn;* Cuming's Head, *Archer;* Coal River Tier, *Oldfield.*

The species is also in New Zealand.

ORDER CXXXIII. PALMÆ.

Flowers unisexual or rarely hermaphrodite. Perianth inferior and persistent in the females, of 6 usually dry or rigid segments in 2 series, the outer ones usually imbricate or united in a 3-toothed or 3-lobed cup, the inner usually longer, valvate in the males, valvate or imbricate in the females. Stamens in the males 3, 6, or indefinite, attached to the receptacle and often surrounding a rudimentary or imperfect ovary; filaments usually short; anthers erect attached at the base or shortly above the base and somewhat versatile, with 2 parallel cells opening inwards in longitudinal slits. Staminodia in the females when present and stamens in the hermaphrodite flowers usually 6, attached to the base of the perianth. Ovary in the females superior, either 3-celled or divided into 3 distinct carpels, or in some genera 1-celled from the first and in many genera only 1 cell fertile. Style usually very short or completely divided into 3 short thick stigmas or lobes stigmatic inside, at first erect afterwards spreading, rarely columnar with 3 small terminal stigmas. Ovules solitary or rarely 2 in each cell or carpel, erect and anatropous or rarely laterally attached or pendulous and amphitropous or orthotropous. Fruit an indehiscent drupe or berry, the exocarp often thick succulent fleshy or spongy and fibrous, sometimes thin and hard, the endocarp membranous crustaceous or hard and bony. Seed solitary or sometimes 2 or 3; testa thin or crustaceous, adnate to the albumen or sometimes more or less to the endocarp; hilum orbicular oblong or shortly linear, basal and oblique or rarely lateral or terminal,

the raphe sometimes variously ramified. Albumen hard cartilaginous or white and brittle, entire ruminate or excavated on one side. Embryo small in a small cavity either basal and near the hilum or dorsal and more or less distant from it.—Woody plants either with long weak or climbing stems and alternate leaves, or with an erect stem or caudex often very tall with a terminal crown of large leaves which in decaying leave the stem covered with scales or fibres, or marked with annular scars. Leaves large, either pinnately or palmately divided into long lobes or segments, rarely bipinnate. Flowers usually numerous and small for the plant, in simple spikes or branched panicles called *spadices*, usually pendulous and arising from amongst the leaves or from the trunk below them, and at first entirely enclosed in a large bract called a *spatha*, opening laterally and finally deciduous with frequently 1 or more smaller sheathing bracts below the spatha, and rarely none but sheathing bracts below or on the rhachis of the spadix. Flowers usually sessile along the rhachis or branches of the spadix, often especially the males 2 together from the same node or notch, subtended by 1 or 3 small bracts not unfrequently reduced to a slightly raised margin of the node.

This splendid order, the pride of all tropical regions, is restricted in Australia to few species and almost confined to Arnhem's Land and Queensland, only four species extending into New South Wales, one of them penetrating as far south as Gipps' Land, besides three species endemic in Lord Howe's Island. None of the Australian genera but the majority of the species are endemic, most of them congeners and nearly allied to the Palms of the Malayan Archipelago or of New Caledonia.

Climbing palms, with alternate prickly pinnate leaves. Flowers diœcious. Perianth-segments all valvate. Fruit covered with imbricate scales. Embryo basal . 1. Calamus.
Erect palms, with a terminal crown of simply pinnate leaves. Flowers monœcious. Outer perianth-segments imbricate.
Inner perianth-segments valvate in the males, imbricate in the females. Embryo basal.
Ovary 1-celled. Ovule erect. Albumen entire.
Fruit usually ovoid. Remains of the style terminal . 2. Kentia.
Fruit obliquely globular. Remains of the style excentrical or lateral . . . . 3. Clinostigma.
Ovary 1-celled. Ovule pendulous. Albumen ruminate 4. Ptychosperma.
Ovary 1-celled. Ovule erect. Albumen ruminate . . 5. Areca.
Ovary 3-celled. Ovule erect. Fruit large. Albumen entire. . . . . 6. Cocos.
Inner perianth-segments valvate in both sexes.
Ovary 3-celled. Albumen entire. Embryo dorsal. . 7. Arenga.
Erect palms, with bipinnate leaves. Inner perianth-segments valvate in both sexes. Ovary 3-celled. Albumen ruminate. Embryo dorsal . . . . 8. Caryota.
Erect palms, with a terminal crown of fan-shaped leaves. Flowers hermaphrodite. Perianth-lobes or segments all valvate. Stamens 6. Embryo dorsal.
Filaments united at the base in a cup or ring. Leaf-lobes truncate and toothed at the end . . . . . 9. Licuala.
Filaments very broad at the base and contiguous but free. Leaf-lobes acuminate . . . . 10. Livistonia.

1. CALAMUS, Linn.

Flowers diœcious, distichous and sessile along the spike-like branches of the panicle. Outer perianth 3-lobed, inner of 3 segments, the lobes or segments all valvate in both sexes. Stamens in the males 6, round a rudimentary ovary. Staminodia in the females 6. Ovary 3-celled, with 1 erect ovule in each cell. Stigmas 3, sessile or on a very short style. Fruit globular, closely covered with reflexed imbricated shining scales. Seed usually 1 only, nearly globular, obliquely attached towards the base, testa thin. Albumen hard, entire. Embryo basal or nearly so.—Prickly palms, with weak stems often climbing to a great height. Leaves simply pinnate, the rhachis and sheaths usually armed with hooked or straight prickles, and in some species not Australian ending in a simple armed tendril. Flowers small, the spikes in partial panicles, few or numerous, in a loose general panicle proceeding from a narrow prickly sheath or spatha, and often from the base of the panicle or from a leaf-sheath below it proceeds a long prickly simple thong or *lorum*, probably an abortive branch of the inflorescence.

The genus is chiefly abundant in tropical Asia, extending also into tropical Africa. The Australian species are as far as known endemic, but require further comparison with some little known ones from the Malayan Archipelago.

Leaf-segments acuminate and entire with smooth edges . . 1. *C. australis.*
Leaf-segments more or less scabrous on the edges with minute distant prickles, and often sprinkled underneath with straight prickles or bristles.
  Leaf-segments acuminate and entire, under 1 in. broad . 2. *C. Muelleri.*
  Leaf-segments hooked or jagged at the end, 1 to 2 in. broad . . . . 3. *C. caryotoides.*

1. **C. australis,** *Mart. Hist. Nat. Palm.* iii. 342.—A slender reclining palm (*A. Cunningham*), climbing to a great height (*F. Mueller*). Leaves often above 2 ft. long, the rhachis armed underneath with short conical recurved prickles, scattered in the lower part, distant in a single row towards the upper end, the upper side of the petiole and lower part of the rhachis armed with straight prickles or bristles mostly turned upwards; segments 10 to 20, the lower ones often 1 ft. long and 1½ in. broad, the upper ones smaller, all shortly acuminate and entire, the edges smooth and the surface without prickles. Panicles long and loose, the main rhachis armed with recurved prickles and long lora armed with recurved prickles, the partial panicles almost or quite recurved. Male spikes 1 to 1½ in long, the flowers closely distichous within broadly ovate acute bracts of about 1 line. Outer perianth thick, obtusely lobed, about 1½ lines long, inner longer, on a short stipes, the segments narrow and thinner. Female spikes 3 to 4 in. long, the flowers more distant. Fruit globular, 4 to 5 lines diameter.—Wendl. and Drude in Linnæa, xxxix. 197; *C. obstruens*, F. Muell. Fragm. v. 48.

Queensland. Shaded woods, Fitzroy Island, *A. Cunningham*, *M'Gillivray*; Rockingham Bay, *Dallachy*.

This species was comprised by Martius amongst those which were insufficiently known enumerated *after* his 4th and last division of the genus, but incautiously placed by Wendland and Drude *under* that division, characterised by the presence of both lora and tendrils terminating the leaves; the *C. australis* has lora but no leaf tendrils.

2. **C. Muelleri,** *Wendl. and Drude in Linnæa*, xxxix. 193.—Stem covered with closely appressed or adnate leaf-sheaths very densely armed with straight slender prickles or bristles. Leaves in our specimens from under 1 ft. to 1½ ft. long, with 10 to 16 segments, the longest 8 in. long and ¾ in. broad, all shortly acuminate, the margins scabrous with a few minute hooked prickles, and the under surface occasionally sprinkled with a few slender straight prickles or bristles, the rhachis armed with scattered hooked or reflexed prickles. Main rhachis of the inflorescence often very long slender and armed with recurved prickles, bearing a few distant simple panicles of 2 or 3 in. each with 3 or 4 to 10 or 12 branches or spikes and almost or quite unarmed. Lora slender, 1 to 2 ft. long, with numerous hooked prickles. Outer perianth-segments in the males 1 line, inner segments 2 lines long. Stamens inserted on a thick disk. Staminodia in the females of the shape of the perfect stamens, the filaments shortly united in a ring, the anthers without pollen. Fruit globular, 5 to 6 lines diameter.

Queensland. Brisbane River, *F. Mueller.*
N. S. Wales. Clarence River, *Beckler*; Richmond River, *Henderson.*

C. radicalis, Wendl. and Drude in Linnæa, xxxix. 195, is described only from a single leaf or rather a portion of a leaf and a lorum, closely resembling those of *C. Muelleri*, except that the leaf is at least 2½ ft. long and has 42 segments. There is nothing to show whether it be the leaf of a barren luxuriant stem of *C. Muelleri* or that of a distinct species.—North of Port Mackay, *Nernst.*

3. **C. caryotoides,** *Mart. Hist. Nat. Palm.* iii. 338.—Branches and adnate sheaths armed with straight prickles and bristles like those of *C. Muelleri* but much shorter. Leaves the same length and similarly armed, but the segments mostly broader some as much as 2 in. broad, truncate and toothed or jagged at the end, the edges scabrous with minute prickles as in *C. Muelleri.* Inflorescence long and loose, but the partial panicles not distant as in that species.—Fruits much smaller, not above 3 lines diameter in our specimens, but perhaps not full grown.

Queensland. Endeavour River and Bloomfield Rivulet between that and Cape Grafton, "Ground Palm," *A. Cunningham.*

2. KENTIA, Blume.

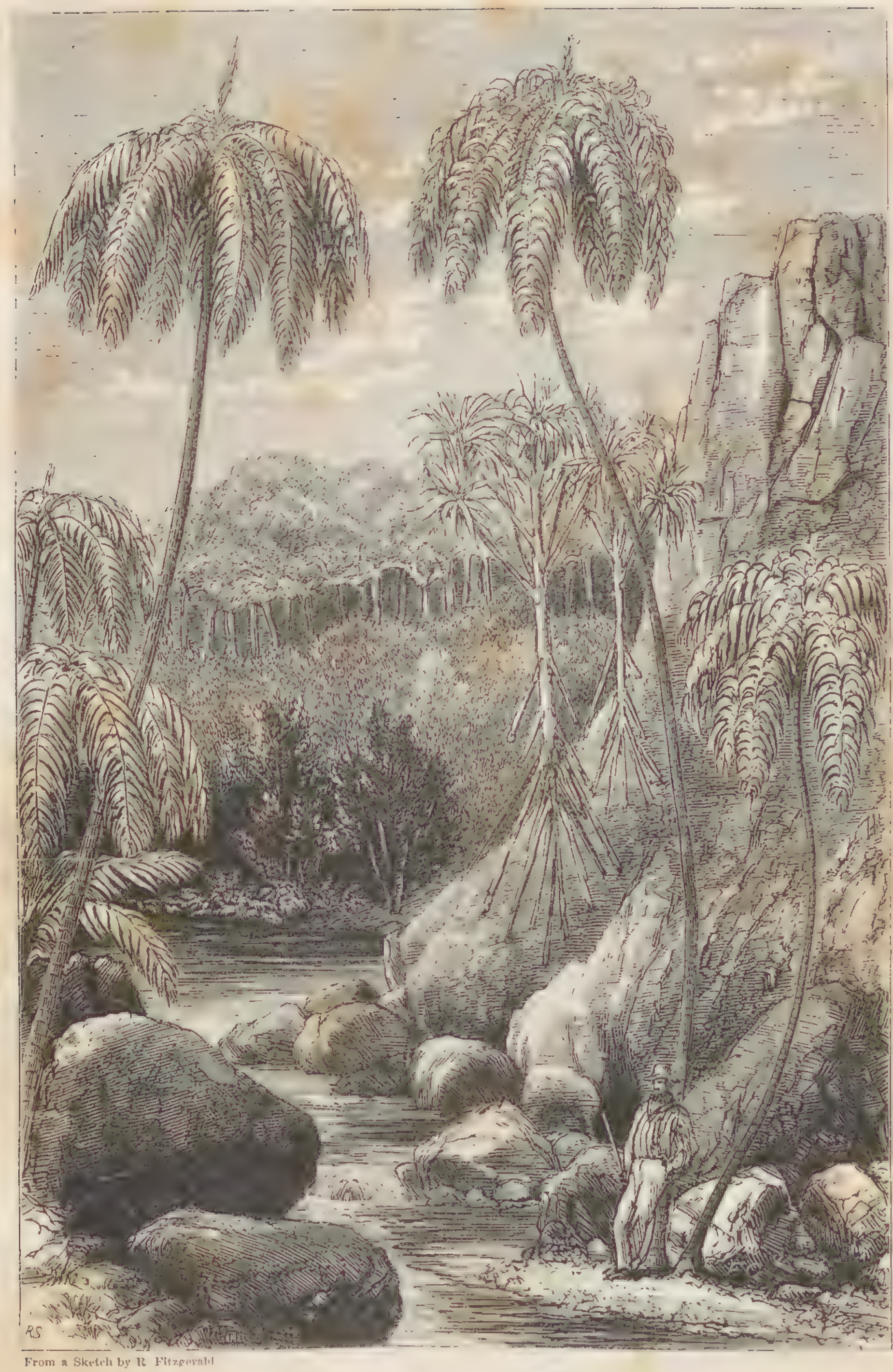
(Linospadix, Grisebachia, Hydriastele, and Hedyscepe, *Wendl. and Drude*; Kentiopsis, *A. Brongn.*)

Flowers monœcious in the same spadix, sessile in the notches of a simple or branched rhachis, usually 2 males in each notch, and a female one later developed in the same notch, the upper males sometimes solitary, Male flowers: Outer perianth of 3 imbricate broad or narrow segments, inner longer of 3 valvate segments. Stamens 6 to about 20, inserted on a thick disk or receptacle, without any or with a small rudimentary ovary in the centre; anthers oblong or linear, longer or rarely shorter than the filaments. Female flowers: Perianth-segments of both series broad and imbricate, the inner not much longer or rarely shorter than the outer. Staminodia none or small. Ovary 1-celled, with 1 ovule erect from the base but excentrically attached. Stigmas 3, at first erect and connivent, at length spreading. Drupe ovoid or ellipsoid; exocarp fleshy and succulent or when dry hard and fibrous; endocarp usually thin. Seed erect, the hilum oblique or more or less lateral; testa thin often adhering more or less to the endocarp, leaving the albumen marked with the ramifications of the raphe but quite entire, not ruminate.—Small or tall erect palms, the caudex marked with annular scars. Leaves in a terminal crown, long and pinnately divided, the segments acuminate and entire or jagged or toothed at the end. Inflorescence at the base of the leaves long and simple or branched, at first enclosed in a rather thin spatha.

Besides the Australian species which are all endemic there are a few from the Indian Archipelago and New Caledonia. The genus has however been variously extended or restricted by different phœnicologists. I have followed in its delimitation the views of F. Mueller, which appear most in conformity with those of Blume, although in the original species the male flowers are hexandrous. In the Australian species the number of stamens varies considerably but always more than 6, they would therefore be referrible to A. Brongniart's genus *Kentiopsis* (Comptes Rendus, 1873) which appears to me to be too artifically separated fom *Kentia*.

Spadix a long and simple spike within the spatha.
  Rhachis slender, slightly notched.
    Flowers rather distant, the males 3 to 4 lines long.
      Stamens about 10. Fruit ovoid-globular $\frac{1}{2}$ in. long 1. *K. monostachya.*
    Flowers approximate, the males $1\frac{1}{2}$ lines long.
      Stamens about 12. Fruit (unripe) cylindrical 8 lines long . . . . 2. *K. minor.*
  Rhachis thick, deeply notched. Stamens about 20.
      Fruit ovoid-oblong above 1 in. long . . . . . 3. *K. Belmoreana.*
Spadix branched. Rhachis slightly notched.
  Spikes or branches long slender and pendulous. Fruit
      ovoid-globular 4-5 lines long . . . . 4. *K. Wendlandiana.*
  Spikes or branches spreading. Stamens 10 to 12.
      Fruit ovoid-oblong above 1 in. long . . . . . 5. *K. Canterburyana.*
Insufficiently known species . . . . 6. *K. acuminata.*

1. **K. monostachya,** *F. Muell. Fragm.* vii. 82.—Stem 6 to 12 ft. high (*A. Cunningham*). Leaves $1\frac{1}{2}$ to 4 ft. long, the sheathing base broad, coriaceous, about 6 in. long, produced into 2 stipule-like lobes, segments very irregular, acuminate, very variable in breadth and distance, adnate to the rhachis or tapering at the base, the longest about 1 ft. long. Inflorescence a pendulous undivided slender spike of great length, the peduncle below the spatha $1\frac{1}{2}$ to 2 ft. long, enclosed at the base to nearly half its length in a sheath, the spike itself 1 to near 2 ft. long, enclosed in a membranous spatha at length open along one side, the rhachis slender; notches scarcely indented, the margins or bracts very slightly prominent, and not very close together. Male



From a Sketch by R. Fitzgerald

Ficus. *Pandanus.*

Kentia Forsteriana *Kentia Belmoriana*

perianth when fully out 3 to 4 lines long, the outer broad segments about 1 line diameter. Stamens about 10, with very short filaments. Female perianth: outer segments as in the male, inner as broad but larger. Ovary 1-celled, with 1 erect ovule. Fruit ovoid or nearly globular, about ½ in. long, the succulent pericarp not very thick. Testa of the seed adhering to the thin endocarp.—*Areca monostachya*, Mart. Hist. Nat. Palm. iii. 178; *Linospadix monostachyos*, Wendl. and Drude in Linnæa, xxxix. 198.

Queensland. Cape York Peninsula, *Hann's Expedition*; Wide Bay, *Leichhardt*; Maroochie, *Bernays*.

N. S. Wales. Mount Lindsay, *W. Hill*; New England, *C. Stuart*; Clarence and Hastings Rivers, *Beckler*; Clarence River, *Wilcox*; Macleay River, *Fitzgerald*; Richmond River, *Mrs. Hodgkinson*. "Walking-Stick Palm."

2. **K. minor,** *F. Muell. Fragm.* viii. 235.—"Stems several from the same rhizome, 2 to 5 ft. high, ½ in. thick. Leaves attaining 3½ ft.;" segments 12 to 14, 6 to 10 in. long, acuminate or more frequently toothed or jagged at the end, the lower ones ½ to ¾ in. broad, the upper ones broader, the terminal ones confluent at the base and about 2 in. broad. Spikes in the specimens simple, slender, 6 to 9 in. long on a peduncle at least as long, scarcely above 1 line thick, with the scar of the fallen spatha a little below the spike, the rhachis not thicker, the notches slightly indented and close together. Male perianth in the specimens nearly 1½ lines long but perhaps not fully out, the outer segments very short. Stamens about 12, the filaments not much shorter than the anthers. Female perianth shorter than in the males the inner segments about twice as long as the outer. Ovary oblong, fleshy, with 1 erect ovule. Fruit "in an unripe state cylindrical, 8 lines long, 1 line thick, tapering at each end. Seed ½ in. long, the albumen not ruminate."

Queensland. Moresby and Russell Rivers and Bellenden Range, *W. Hill*; Daintree River, *Fitzalan*. Of the fruit I have only seen fragments.

3. **K. Belmoreana,** *F. Muell. Fragm.* vii. 99; viii. 234.—Stems attaining 35 ft. Leaves 6 to 8 ft. long with numerous acuminate segments. Inflorescence of long and thick simple nodding or pendulous spikes, said to attain 5 ft. and 2 to 3 ft. long on a peduncle of 1 ft. in the specimens seen, each enclosed in a rather thin spatha at length open on one side, but ending in an entire flattened solid point of 2 to 3 in. Rhachis at least ½ in. diameter with a triple spire of deeply excavated notches closely crowded with raised margins. Male perianth broadly oblong or ovoid, about 4 lines long, the outer broad prominently keeled segments about 2 lines diameter. Stamens about 20. Female flowers only seen very young. Fruit oblong or ellipsoid, 1 to 1½ in. long, the pericarp hard in the dried state. Testa more or less adhering to the endocarp, the endocarp marked outside with the ramifications of the raphe as in other species.—*Grisebachia Belmoreana*, Wendl. and Drude in Linnæa, xxxix. 202; *Howica Belmoreana*, Beccari, Malesia, 66.

N. S. Wales. Lord Howe's Island, *C. Moore, Fullagar.*

F. Mueller distinguishes two species, the *K. Belmoreana* or "Curly Palm" with the segments of the leaves converging upwards and *K. Forsteriana* (F. Muell. Fragm. vii. 100; *Grisebachia Forsteriana*, Wendl. and Drude, l. c. 203; *Howeia Forsteriana*, Beccari, l. c.) or "Thatch or flat-leaved Palm," with the segments hanging. The specimens as far as they go show no difference that I can discover in the male flowers and fruits, and the distinctness of the two whether as varieties or species remains to be ascertained.

4. **K. Wendlandiana,** *F. Muell. Fragm.* vii. 102.—A tall palm. Leaves many feet long, the segments numerous, unequal, the longest $1\frac{1}{2}$ ft. long, the upper ones confluent at the base, all or mostly jagged or toothed at the apex. Panicle of numerous slender pendulous spikes of about 1 ft., the common peduncle very short broad and thick, marked with the scars of the spatha and of 2 outer bracts, the primary branches very short and thick, the rhachis of the spikes slender, the notches very little immersed. Spatha and male flowers unknown. Female perianth under the fruit about 2 lines diameter, the segments all very broad, the inner twice as long as the outer ones. Fruit ovoid or globular, when dry about 4 lines diameter and longitudinally striate with prominent ribs, succulent when fresh with a thin endocarp. Seed erect, with an oblong oblique basal hilum, the testa free from the endocarp, the albumen not ruminate.—*Hydriastele Wendlandiana*, Wendl. and Drude in Linnæa, xxxix. 209.

N. Australia. Liverpool River, *Gulliver.*
Queensland. Cape York, *W. Hill, Daemel;* Cape Sidmouth, *Curdie.*

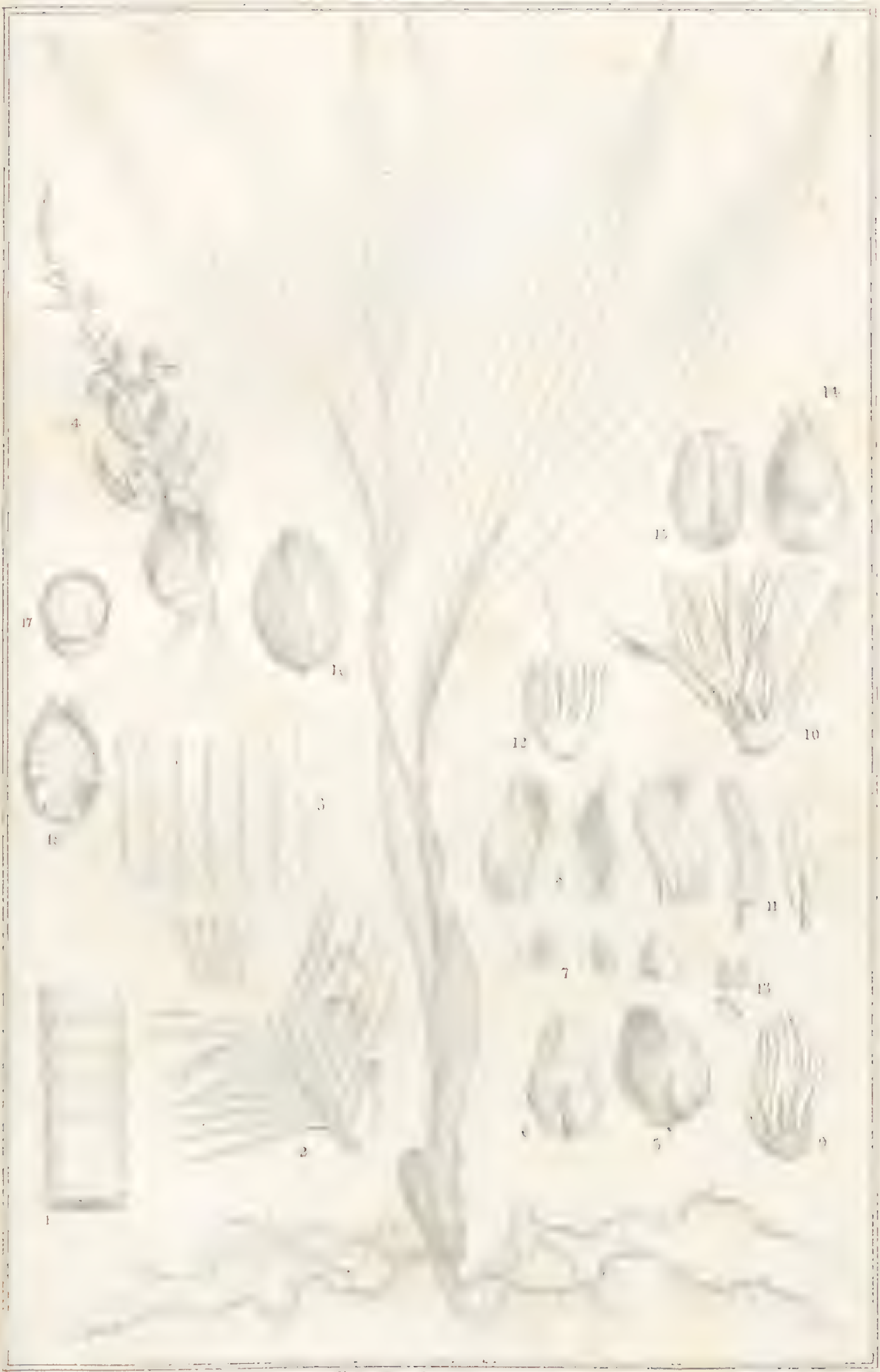
The Arnhem's Land and Queensland specimens appear to belong to one species, but it is possible that when better known they may prove to be distinct.

5. **K. Canterburyana,** *F. Muell. Fragm.* vii. 101; viii. 234.—A tall palm with a dense head of long pinnate leaves, the segments numerous, nearly equal and acuminate. Panicle branching into spreading spikes of about 6 in., the rhachis thick and flexuose, the notches not immersed and not close. Spatha unknown. Male perianth about 4 lines long, the outer segments narrow-lanceolate, about 2 lines, the inner ones broader and striate. Stamens 10 to 12, shorter than the perianth, although the filaments are as long as or longer than the anther. Central rudimentary ovary oblong. Female perianth: outer segments 3 lines broad and almost as long, inner ones ovate and rather shorter. Ovary 1-celled, with 1 erect ovule, but imperfect in the flowers examined. Fruit ellipsoid, $1\frac{1}{2}$ in. long, the pericarp hard when dry. Seed erect as in the other species, but the linear hilum extending far up one side; testa thin more or less adhering to the endocarp, leaving the albumen reticulate with the complicated ramifications of the raphe.—*Hedyscepe Canterburyana.* Wendl. and Drude in Linnæa, xxxix. 204.

N. S. Wales. Lord Howe's Island, *C. Moore; Fitzgerald.* "Umbrella Palm."

6. **K. ? acuminata,** *Wendl. and Drude in Linnæa,* xxxix. 207.—Only known from a single leaf and a loose fruit. Leaf about 3 ft. long but

Tab XLIII.



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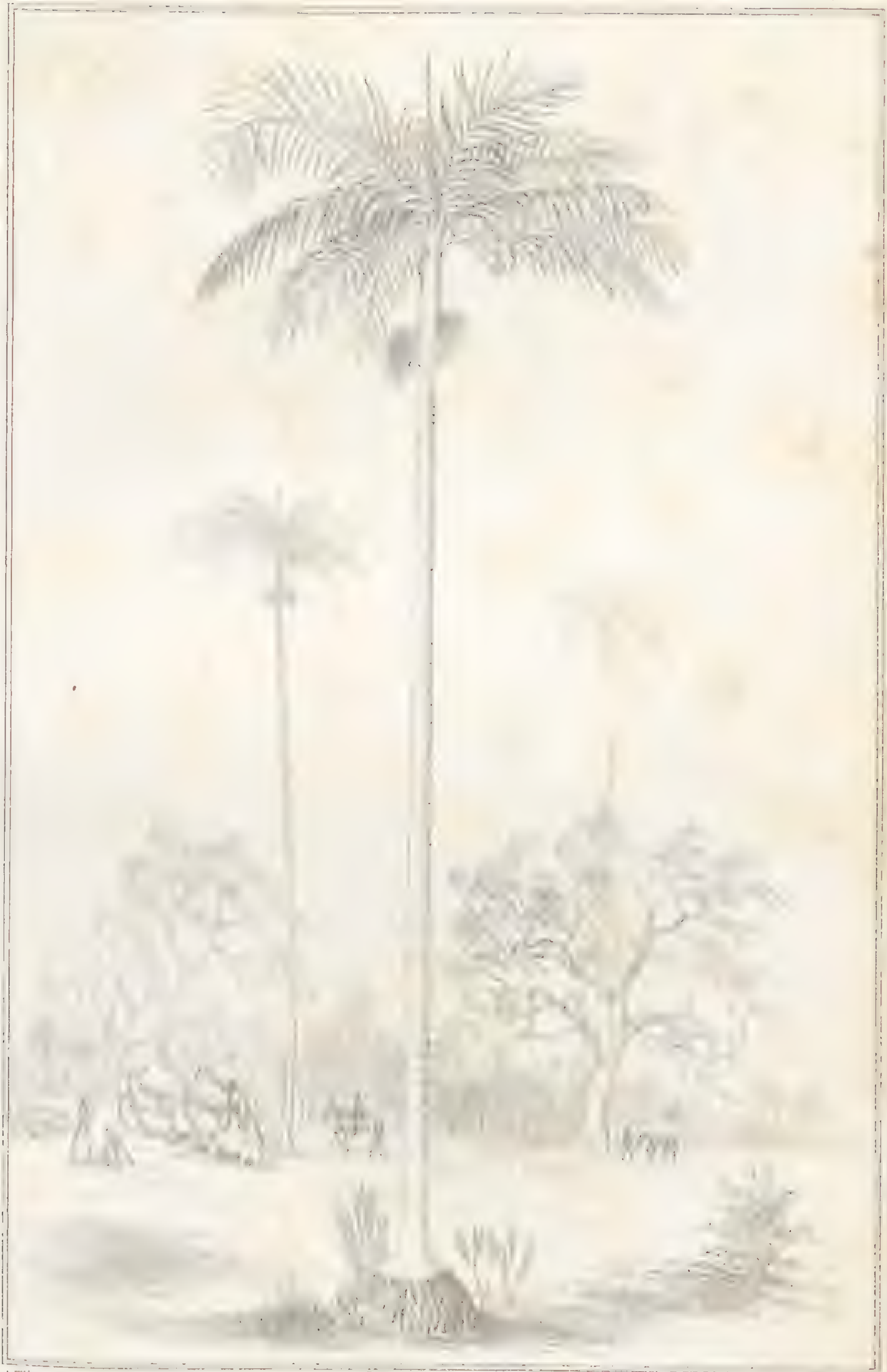
Ptychosperma Alexandrae. *F. M.*



A Thozet del. F. Schenfeld lith.   F. Mueller direxit.   De Gruchy & Leigh imp.

Ptychosperma Alexandrae. *F. M.*

the lower part wanting, the rhachis slightly scurfy-tomentose. Segments 22, the lower ones very narrow acuminate and entire, the intermediate ones gradually broader and 2-toothed, the terminal pair confluent at the base $1\frac{1}{2}$ in. broad, truncate and many toothed at the apex each one readily splitting into 2. Fruit ovoid-globular, $\frac{3}{4}$ in. long.

W. Australia. Escape Cliffs, *Hulse.*

The materials are not sufficient to characterise a species, yet neither the leaf nor the fruit can be referred to the *K. Wendlandiana*, the only other pinnate-leaved Palm of which I have seen specimens from Arnhem's Land.

3. CLINOSTIGMA, Wendl.

(Cyphokentia, *A. Brongn.*)

Flowers monœcious in the same spadix, sessile along the branches, the males usually 2 together, the females solitary (later developed on the same notches?). Male flowers: outer perianth of 3 imbricate segments, inner longer of 3 valvate segments. Stamens 6 surrounding an abortive ovary. Female flowers: segments of both series imbricate. Ovary 1-celled? with 1 erect ovule. Fruit obliquely globular, the scar or remains of the style very excentrical or quite lateral. Seed erect, quite detached from the pericarp. Albumen not ruminate. Embryo basal.—Erect palms with the habit and pinnate leaves of *Kentia.*

Besides the Australian species, which is endemic, there are several from New Caledonia.

1. **C. Mooreanum,** *F. Muell. Fragm.* viii. 235.—A dwarf palm of 3 or 4 ft. Leaves said to be 3 or 4 ft. long, the segments numerous, about 1 ft. long, the young ones of our specimens longitudinally plicate. Inflorescence closely sessile; the spatha coriaceous, broadly ovate, about 6 in. long, with 2 outer concave bracts. Panicle very much branched, at first compact, spreading to about 1 ft. long and broad when in fruit. Male flowers very numerous, not yet open in our specimens, nearly globular, and about 1 line diameter, the outer segments half as long. Female perianth under the fruit expanded to 3 or 4 lines diameter. Fruit obliquely globular, about $\frac{1}{2}$ in. diameter. Seed with an oblong oblique almost lateral hilum.—Wendl. and Drude in Linnæa, xxxix. 218; *Kentia Mooreana,* F. Muell. Fragm. vii. 101; viii. 234.

N. S. Wales. Lord Howe's Island, summits of Mount Gower and Mount Lingbird, *C. Moore.*

4. PTYCHOSPERMA, Labill.

(Seaforthia, *R. Br.*; Laccospadix and Archontophœnix, *Wendl. and Drude.*)

Flowers monœcious in the same spadix, sessile in the notches of a simple or branched rhachis, usually 2 males in each notch and a female one later developed in the same notch. Male flowers: outer perianth of 3 imbricate broad segments; inner longer, of 3 valvate segments. Stamens 6 to about 20, inserted on a thick disk or receptacle without any rudimentary ovary; filaments shorter than or rarely as long as the anthers. Female flowers: perianth-segments of both series broad and imbricate, the inner not much longer than the outer. Staminodia none or small. Ovary 1-celled, with 1 ovule pendulous from the apex, the attachment slightly excentrical. Stigmas 3, at first erect and connivent, at length recurved. Drupe ovoid or globular, the pericarp succulent or when dry hard and fibrous. Seed with a terminal hilum, the thin testa more or less adnate to the endocarp, the albumen often but not always furrowed, deeply ruminate.—Tall palms, the caudex marked with annular scars. Leaves in a terminal crown, long and pinnately divided, the segments acuminate and entire or jagged or toothed at the end. Inflorescence under the leaves, long and simple or branched, at first enclosed in a rather thin spatha, with one or two sheaths or bracts below it.

Besides the Australian species, which are probably all endemic, there are a few in the Malayan Archipelago and (if truly congeners) in New Caledonia.

Wendland and Drude place *Ptychosperma* and *Archontophœnix* in a division with the ovules laterally attached their whole length, and Beccari in his character both of *Kentia* and of *Ptychosperma* describes the ovule as parietal. Both appear to have overlooked the important exceptional character of *Ptychosperma*, well pointed out by Blume, of the ovule pendulous from the apex, whilst in *Kentia* it is erect from the base, a character which I have verified in all the Australian species of the two genera of which I have had the female flowers.

Spadix long and simple . . . . 1. *P. laccospadix.*
Spadix branched.
  Leaf-segments acuminate. Male buds mostly oblique and rather acute.
  Leaf-segments whitish underneath . . . . 2. *P. Alexandræ.*
  Leaf-segments green on both sides . . . . 3. *P. Cunninghamii.*
  Leaf-segments jagged or truncate at the end. Male buds straight and obtuse . . . . 4. *P. elegans.*

1. **P. laccospadix,** *Benth.*—Stems "12 ft. high and 2 in. or more in diameter." Leaves several feet long, the segments numerous, acuminate or slightly notched at the end, the rachis slightly scurfy. Spikes simple "long and rope-like," above 2 ft. long in the specimen seen, the rhachis 3 or 4 lines diameter, the notches spirally approximate with very prominent borders, almost as in *Kentia Belmoreana.* Flowers unknown, except the old female perianths under the fruit, which are quite as in the congeners. Fruit red, ovoid, umbonate with the remains of the style, about 5 lines long, the pericarp not thick. Seeds closely adnate to the endocarp, with a terminal hilum. Albumen ruminate.—*Laccospadix australasicus*, Wendl. and Drude in Linnæa, xxxix. 206.

Queensland. Rockingham Bay, *Dallachy.*

2. **P. Alexandræ,** *F. Muell. Fragm.* v. 47 213, t. 43, 44.—A tall palm the stem attaining 70 to 80 ft. Leaves several feet long, the rhachis very broad and thick, glabrous or slightly scurfy, the segments

numerous, the longer ones 1½ ft. long ½ to 1 in. broad, acuminate and entire or slightly notched, green above, ashy-glaucous or white underneath. Spatha 1½ ft. long. Panicle when open above 1 ft. long and broad; much branched, the rhachis more or less angular and flexuose, the notches scarcely immersed. Male perianth 2 to 3 lines long, the inner segments very frequently oblique, pale coloured, smoother and more acute than in *P. elegans*. the outer segments about 1 line long, slightly imbricate. Stamens usually 9 or 10, but varying in the flowers examined from 6 to 14, the filaments very short. Female perianth about 2 lines long, the segments all broad, and about equal in length. Fruit ovoid-globular, 7 to 9 lines long. Ovary and seed of the genus.—Fl. des Serres., t. 1916 (copied from F. Mueller); *Archontophœnix Alexandræ*, Wendl. and Drude in Linnæa, xxxix. 212.

Queensland. Rockingham Bay, *Dallachy*.

3. **P. Cunninghamii,** *Wendl. in Bot. Zeit.* 1858, 346.—A tall palm with the habit and inflorescence of *P. Alexandræ* and *P. elegans*, the segments of the leaves acuminate and entire or scarcely notched as in the former, but green on both sides. Flowers only known from the figure in the Botanical Magazine, where the perianth appears to be somewhat oblique and the inner segments rather acute though not so much so as in *P. Alexandræ*. Fruit unknown.—*Seaforthia elegans*, Hook. Bot. Mag. t. 4961, not of R. Br.; *Archontophœnix Cunninghamii*, Wendl. and Drude in Linnæa, xxxix. 214.

Queensland. Sunday Island (E. coast, near Cape York), *A. Cunningham*; Rockhampton, *Nernst*.

N. S. Wales. Illawarra, *A. Cunningham*; Woollongong, *Ramsay*.

This species, if really distinct from *P. elegans*, is as yet very imperfectly known. No flowers have been preserved. Cunningham's specimens were gathered at the same time and place as a leaf of the true *P. elegans*, and no garden specimens have flowered since, the one figured. The fruits and analysis in the plate quoted are copied from Martius' plate of *R. elegans*.

Archontophœnix Veitchii, Wendl. and Drude in Linnæa, xxxix. 213, known only in leaf, does not appear to me to differ from *P. Cunninghamii*, judging at least from O'Shanesy's Rockhampton specimen.

4. **P. elegans,** *Blume, Rumphia*, ii. 118.—Variously described as a low or very tall palm. Leaves attaining several feet, the segments numerous, more or less toothed or irregularly jagged at the end. Panicles lateral, 1 to 1½ ft. long and broad, branching into numerous spikes, the main rhachis flattened or angular, the ends of the spikes very flexuose, the notches scarcely excavated. Male perianth about 2 lines long, the bud straight and obtuse, the outer segments about half as long. Stamens from under 10 to above 20, the filaments shorter than or perhaps ultimately as long as the anthers. Female perianth spreading under the fruit to a diameter of above 3 lines, the inner segments not much longer than the outer. Fruit ovoid-globose, nearly ½ in. diameter. Albumen deeply and irregularly ruminate.—*Seaforthia*

elegans, R. Br. Prod. 267; Mart. Hist. Nat. Palm. iii. 181, t. 105, 106, 107.

Queensland. Endeavour River, *Banks and Solander;* Cape York, *W. Hill, Daemel:* Sunday Island, *A. Cunningham;* Cumberland Islands, *Nernst;* Rockhampton and neighbourhood, *Thozet, Nernst.*

P. capitis-yorkii, Wendl. and Drude in Linnæa, xxxix. 217, is described from a leaf and spadix without flowers from Cape York, *Veitch*, which I have not seen, but I can find nothing in the character given to distinguish it from several of Daemel's Cape York specimens of *P. elegans.*

5. **ARECA,** Linn.

Flowers monœcious in the same spadix, the upper ones or all of some branches males and singly sessile or 2 together, the females singly sessile along the main rhachis or at the base of the branches. Male flowers: outer perianth-segments 3, scarcely imbricate, inner 3, longer and valvate. Stamens 3 to 15, filaments short; ovary rudimentary. Female flowers: perianth-segments of both series imbricate. Staminodia small. Ovary 1-celled, with 1 erect ovule. Stigmas 3, at first erect, at length spreading. Drupe ovoid, the exocarp succulent and fibrous, the endocarp crustaceous. Seed erect; albumen deeply ruminate; embryo basal.—Tall palms with a crown of long pinnate leaves. Spadix branching, inserted below or amongst the leaves, the spatha single, membranous or fibrous-coriaceous.

The genus extends over East India and the Malayan Archipelago and perhaps to Madagascar. The only Australian species is as yet very doubtful as to its character and affinities.

1. **A. Normanbyi,** *F. Muell. Fragm.* viii. 235.—Said to be a palm of 40 to 60 ft. with leaves 8 to 10 ft. long, and an axillary inflorescence, but described from a single fruit, ovoid with a conical tip, about 1½ in. long, the pericarp almost woody, resting on an old perianth of which the outer series is nearly 3 lines, the inner series ½ in. diameter. Seed large, erect, adhering on one side halfway up the endocarp, the albumen deeply ruminate.—*Cocos Normanbyi*, W. Hill, Rep. Brisb. Bot. Gard. 1874–6 (*F. Mueller.*)

Queensland. Daintree River, *W. Hill.*

6. **COCOS,** Linn.

Flowers monœcious in the same spadix, the upper ones male and densely crowded, the lower females few. Male perianth: outer segments 3, imbricate, inner 3 much longer, valvate. Stamens 6, with thick filaments; anthers erect but attached above the base. Ovary rudimentary. Female perianth: segments all nearly equal, broad, imbricate. Ovary 3-celled, with 1 erect ovule in each cell but 2 usually abortive. Stigmas 3, at first erect, at length spreading. Drupe large, ovoid or oblong, with a thick fleshy and fibrous exocarp; endocarp bony, marked at the base with 3 pits.

Seed solitary, enveloped in pulp; hilum lateral; albumen not ruminate. Embryo basal.—Tall palms, the stem marked with annular scars and long retaining the scale-like base of the petioles. Leaves in a terminal crown, simply pinnate with numerous longitudinally plicate segments. Inflorescence from the base of the leaves, the spadix with numerous long simple branches. Spatha long and woody, with an open outer bract.

The genus comprises several South American species besides the Australian one, which is common in tropical Asia, chiefly near the seacoast, and is spread by cultivation over the tropical regions of the new as well as the old world.

1. **C. nucifera**, *Linn.; Kunth, Enum.* iii. 285.—This, the well-known "Cocoa-nut Palm" attaining often 70 to 80 ft., is said to be of stunted and crooked growth in the open sandy flats of Keppel Bay and about 30 ft. high, the leaves 12 to 16 ft. long with numerous rigid segments. Spatha fusiform, thick and woody, 5 to 6 ft. long, the spikes 1 to 2 ft., the common peduncle 1 ft. Male perianth about 4 lines long, the outer segments scarcely 1 line. Filaments nearly as long as the anthers. Female perianth, with a slightly enlarged ovary in the specimen, very broad and coriaceous, the outer segments about 1 in. diameter, the inner rather larger. Fruit ovoid, obtusely 3-angled, about 6 in. diameter.—Mart. Hist. Nat. Palm. ii. 123, t. 88; Gærtn. Fruct. t. 4, 5; Roxb. Corom. Pl. t. 73.

Queensland. Rockhampton and Keppel Bay, *Thozet.*

7. ARENGA, Labill.

(Saguerus, *Blume.*)

Flowers monœcious, but usually in separate spadices, the males 2 together along the branches, the females singly sessile, the rhachis not excavated. Outer perianth in both sexes of 3 imbricate segments, inner longer of 3 valvate segments. Stamens in the males numerous, without any rudimentary ovary. Ovary in the females 3-celled, with 1 ascending ovule in each cell. Berry fleshy. Seeds 3 or fewer by abortion, each one enveloped in a pellucid pulp; testa thick and hard; albumen horny, not ruminate. Embryo dorsal.—Tall palms, the stem irregularly marked with annular scars, retaining in the upper part the thick basis of the petioles and a network of thick filaments. Leaves in a terminal crown, pinnate with numerous segments toothed or jagged at the end. Spadix with long simple branches, the peduncle enveloped in several imbricate sheathing bracts. Flowers rather large.

The genus consists of very few species, from East India and the Malayan Archipelago. The only Australian one is believed by Beccari to be the common cultivated *A. saccharifera*, Labill. (Beccari, Malesia, 78, *Saguerus saccharifer*, Blume, Rumphia, ii. 128, t. 123, 124), introduced by the Malays, but it is described as *Saguerus australasicus*, Wendl. and Drude in Linnæa, xxxix. 219, from a single large leaf, with 140 or more long narrow rigid segments slightly toothed at the end, from Goold or Garden Islands, *Dallachy*. It is said to be there a beautiful Palm of about 20 ft.

8. CARYOTA, Linn.

Flowers monœcious in the same spadix, sessile in the notches of the long pendulous branches of the inflorescence, usually 2 males in each notch and a female one later developed in the same notch. Outer perianth in both sexes of 3 imbricate ovate segments, inner longer of 3 valvate segments. Stamens in the males numerous, inserted on a thick disk without any rudimentary ovary; filaments very short; anthers linear. Staminodia in the females very small, usually 3. Ovary usually 2 or 3-celled, but only 1 or rarely 2 with a perfect erect ovule in each. Stigmas terminal, at first erect in a cone, at length spreading. Berry or succulent drupe globular, with a thin endocarp. Seeds solitary and globular or 2 and hemispherical, the testa free from the endocarp. Albumen horny, ruminate. Embryo dorsal.—Tall palms, the caudex marked with annular scars. Leaves in a loose terminal crown, very large, twice pinnate, the segments rhomboidal or cuneate, often very oblique and irregularly toothed or jagged.

The genus consists of few species spread over tropical Asia, the only Australian one extending over the Malayan Archipelago to the eastern provinces of East India.

1. **C. Rumphiana**, *Mart. Hist. Nat. Palm.* iii. 195.—Leaves and inflorescence in our specimens perfectly glabrous, the leaf-segments very oblique, half fan-shaped, much plicate, 6 to 8 in. long and 2 to 3 in. broad, rigid, irregularly and obtusely toothed, the lower margin sometimes produced into a long obtuse point, sometimes shorter than the next fold. Spikes often above 2 ft. long. Male flowers about 5 lines or rather more. Stamens above 30. Ovary in the flowers examined with 1 perfect ovule. Fruit globular, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter.—Beccari. Malesia, 70; *C. obtusa*, Griff. in Calc. Journ. v. 480, Palm. Ind. 170, t. 236; *C. Alberti*, F. Muell.; Wendl. and Drude in Linnæa, xxxix. 221.

Queensland. Cape York, *Daemel*, the fruits from *A. Richardson.*

Also in the Malayan Archipelago and the eastern provinces of India. The foliage is exactly that of our specimens of *C. obtusa*, Griff., correctly referred by Beccari to *C. Rumphiana*, Mart. and differs from that of the common *C. urens* chiefly in the very obtuse dentation. Wendl. and Drude observe that the Australian species is remarkable (as compared with *C. urens*) for the great size of the spadix and flowers, but the male flowers in our specimens are exactly the size of those of the true *C. urens*, when fully out, and in that species the spadix according to Griffith attains 10 to 12 ft.

9. LICUALA, Rumph.

Flowers hermaphrodite, in a loose panicle, with sheathing bracts on the main rhachis and peduncle. Outer perianth 3-lobed or 3-toothed, inner of 3 valvate segments. Stamens 6, the filaments united in a cup

or ring and very shortly free; anthers sagitate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each; style columnar, with 3 small stigmas. Fruit globular, reduced by abortion to 1 carpel, the pericarp fleshy but at length hard, scarcely fibrous. Seed erect, the hilum somewhat lateral. Albumen horny with a deep irregularly branched excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Palms usually slender or low. Leaves large, fan-shaped but usually closed all round so as to appear peltate, the plicate lobes more or less truncate and toothed at the end. Panicles from among the leaves, often long, the partial panicles between the sheathing bracts usually divided into few spreading spikes. Flowers small.

The genus is widely spread over tropical Asia, the only Australian species too little known to determine how far it may be endemic or distinct.

1. **L. Muelleri,** *Wendl. and Drude in Linnæa,* xxxix. 223.—Young trees described as 30 ft. high. Leaves closed all round so as to appear peltate, plicate, and divided to more than half the length into truncate lobes obtusely toothed and jagged and 2 to 3 in. broad at the end, the whole leaf forming a flat stiff shield-like disk 6½ ft. across. Flowers unknown. Fruits "crimson in large straggling panicles," ovoid-globular, 4 to 5 lines diameter. Albumen penetrated by a deep irregularly branched excavation. Embryo dorsal.—*Livistona Ramsayi*, F. Muell. Fragm. viii. 221.

Queensland. Dalrymple Gap, Rockingham Bay, *Dallachy*. Although the flowers are unknown it is probable that Wendland and Drude are correct in transferring this palm from *Livistona* to *Licuala*, but its precise affinities must remain for the present undetermined.

10. LIVISTONA, R. Br.

Flowers hermaphrodite, in a loose panicle, with sheathing bracts on the main rhachis and peduncle. Outer perianth thin, 3-lobed or 3-toothed, inner longer, of 3 valvate segments. Stamens 6, distinct but contiguous; filaments broad and thick very shortly filiform at the top; anthers small, ovate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each. Style shortly columnar, with a 3-toothed stigma. Fruit ovoid or globular, reduced by abortion to a single carpel, the pericarp not thick, hard when dry. Seed erect, the hilum somewhat lateral. Albumen with a deep broad excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Low or tall erect palms. Leaves fan-shaped, plicate, the lobes or segments acuminate and entire or 2-cleft, and frequently a small bristle or filament between the lobes. Panicles usually large and decompound from among the leaves. Flowers very small, solitary or clustered along the slender rhachis of the ultimate branches.

Besides the Australian species which are endemic, there are a very few from the Malayan Archipelago or South China.

Fruit obovoid-oblong. Perianth scarcely 1 line long.
  Petiole more or less aculeate on the edges. Outer perianth-lobes rather obtuse . . . . 1. *L. humilis.*
  Petiole entirely unarmed. Outer perianth-lobes acute . . 2. *L. inermis.*
Fruit globular. Perianth 1½ lines long. Outer perianth-lobes acute . . . . 3. *L. australis.*

1. **L. humilis,** *R. Br. Prod.* 268.—Stems 4 to 6 ft. high (*Martius*) 10 ft. (*Schultz*) 15 ft. or tall (*Gulliver*). Leaves orbicular-cordate in circumference when fully out, with a radius of about 1½ ft., deeply divided into narrow plicate segments tapering to a fine point, the thread-like bristles between the lobes varying from nearly 1 in. to very minute or altogether wanting; petiole much flattened, the acute edges more or less bordered by small prickles in our specimens, but said to be often intermixed with larger ones even as much as ½ in. long. General panicle very large and loose, the partial ones between the sheathing bracts pyramidal and 8 in. to 1 ft. long, twice or three times branched, the ultimate branches or slender spikes ½ to 1 in. long in flower, often twice that in fruit. Flowers numerous, in little sessile clusters along the spikes. Inner perianth-segments scarcely 1 line long, the outer perianth about ½ as long with short broad rather obtuse lobes. Berry ovoid-oblong, obtuse, 7 to 8 lines long, more or less contracted at the base. Seed oblong, somewhat flattened.—Mart. Hist. Nat. Palm. iii. 239, t. 109, 110, 111; Wendl. and Drude in Linnæa, xxxix. 231; *L. Leichhardtii*, F. Muell. Fragm. viii. 221.

N. Australia. Arnhem's Land, *R. Brown* (no specimens seen); Albert River, M‘Adam Range, *F. Mueller*; Port Darwin, *Schultz*, n. 372; Port Essington, *Armstrong;* Liverpool River, and Wood Island, *Gulliver.*

F. Mueller refers to this species a palm found by Giles in the so-called Glen of Palms, Macdonnel Range, in the interior, but the only leaf I have seen looks rather like that of *L. australis.* It cannot however be determined without flower or fruit.

2. **L. inermis,** *R. Br. Prod.* 268.—A moderate sized or tall palm (14 to 30 ft.), with the ovoid-oblong fruits of *L. humilis*, but said to differ in the petioles entirely without prickles and the lobes of the outer perianth more acute.—Mart. Hist. Nat. Palm. iii. 239, t. 145, 146.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.* I have seen no specimen of this palm and Martius appears only to have known it from Bauer's drawings which he copied, the general habit being also represented in Flinder's Voyage in the view of Sir E. Bellew's Island, vol. ii. p. 172. It may prove to be a variety only of *L. humilis.*

3. **L. australis,** *Mart. Hist. Nat. Palm.* iii. 241.—Stems attaining 40 to 80 ft. Leaves in a dense crown, orbicular in circumscription when fully out, 3 to 4 ft. diameter, divided to the middle or lower down into narrow plicate acuminate lobes either entire or 2-cleft at the apex. Panicle large, very much branched, quite glabrous, the primary branches thick, often angular, and usually much curved and flexuose,

the ultimate branches or spikes 1 to 3 in. long. Spatha at the base of the panicle sheathing with a lanceolate point, 6 to 10 in. long. Flowers not so closely sessile as in *L. humilis* and not so small. Inner perianth about 1½ lines long, the outer fully ½ as long with very acute lobes, Fruit globular, 6 to 9 lines diameter, the pericarp hard and crustaceous when dry. Seed globular.—Wendl. and Drude in Linnæa, xxxix. 232 ; Bot. Mag. t. 6274 ; *Corypha australis*, R. Br. Prod. 267 ; *L. inermis*, Wendl. and Drude, l. c. 229.

Queensland. Woods, *W. Hill ;* Rockhampton (Moore's Creek Range), *Thozet.*
N. S. Wales. Illawarra, *Ralston.*
Victoria. Snowy Range, *F. Mueller.* I refer this here on the authority of F. Mueller, Fragm. v. 49. There is only a single small leaf preserved in his herbarium which looks somewhat different.

The specimen figured in the Botanical Magazine was raised at Kew from seeds collected by Cunningham probably at Illawarra. Wendland and Drude can surely not have had access to Martius' work for they refer to a plate of *L. australis* which I cannot find there, besides the mistake they have fallen into as to the *L. inermis.*

ORDER CXXXIV. PANDANEÆ. (Typical Tribe.)

Flowers diœcious, closely packed in dense spikes or heads, of which several in a terminal spike or raceme or rarely solitary with a leafy or coloured bract under each. Perianth none. Males consisting of numerous stamens covering the rhachis, the filaments all distinct or more or less collected or united in clusters. Anthers oblong or linear, 2-celled, the cells opening in longitudinal slits. Females: ovaries numerous, sessile, covering the rhachis and often cohering or connate in clusters or syncarps or all together at least at the base, each ovary 1-celled, with 1 ovule erect from the base, or with numerous ovules superposed in 2 rows on 2 or 3 parietal placentæ. Stigma sessile on the apex of the ovary or of a thick conical style. Fruits drupaceous, densely crowded or more or less connate in globular ovoid or cylindrical heads. Seeds solitary or numerous, with a small embryo at the lower end of a fleshy or horny albumen.—Trees bushes or tall climbers. Leaves undivided, in spires at the top of the stem, or disposed along the branches.

The above character applies only to the typical tribe limited to the Old World and ranging over the tropical regions of Asia, Africa, and islands of the Mascarene group, Malayan Archipelago and South Pacific, the two Australian genera having the most extensive range within that area. To these must be added one or two genera which appear to be really distinct chiefly from New Caledonia, most of those added by Gaudichaud being again reduced to *Pandanus*. Besides these the Order is usually made to include the American tribe *Cyclantheæ* which have often divided leaves, monœcious flowers, and small or rudimentary perianths.

The clusters into which the drupes in some species are united have been sometimes described as many-celled drupes. It seems however more conformable to received terminology to restrict the term drupes to the single pyrenes resulting from the single ovaries, and if necessary to use the term syncarp for the clusters of drupes when perfectly connate.

Stems arborescent or shrubby, the branches terminating in
a triple spire of long leaves. Ovules solitary . . . 1. PANDANUS.
Stems climbing, the branches leafy. Ovules numerous
superposed in 2 rows on 2 or 3 parietal placentas . . 2. FREYCINETIA.

1. PANDANUS, Linn.

Male flowers in dense spikes, sessile or pedunculate in the axils of leafy or coloured bracts, forming a terminal compound spike. Stamens either separate or more or less united in clusters. Female flowers: Ovaries densely packed in a globular or oblong head or spike, with 1 ascending ovule in each. Drupes crowded or connate in a globular or cone-like head, often separable into clusters.—Stem woody, usually arborescent and branching. Leaves, long, coriaceous, spreading, prickly on the edges and often on the midrib, generally closely inserted towards the ends of the branches in 3 spiral series.

The genus is widely spread over the tropical regions of the Old World, chiefly near the sea. Of the four or five Australian species one is common in a great part of the range of the genus, the others appear to be all endemic.

SECT. I. **Keura.** *Filaments connate in clusters. Stigmas peltate or reniform, sessile on the flat convex or broadly conical apex of the ovaries. Drupes connate in clusters or rarely separate.*

Filaments united in a column longer than the free part.
  Drupes connate in clusters, nearly flat on the apex.
    Male spikes sessile . . . . 1. *P. odoratissimus.*
  Drupes all free. Other characters of *P. odoratissimus* . 2. *P. aquaticus.*
  Drupes connate in clusters, each with a conical apex.
    Male spikes pedunculate . . . . 3. *P. pedunculatus.*
Filaments very shortly united at the base. Drupes connate in clusters, each with a very convex apex . . 4. *P. Forsteri.*

SECT. II. **Acrostigma.** *Filaments free. Stigmas raised on the acute or acuminate apex of the ovary or style. Drupes free or equally connate at the base.*

Single Australian species . . . . 5. *P. monticola.*

SECTION I. KEURA, *Kurz.*—Filaments connate in clusters. Stigmas peltate or reniform, sessile on the flat convex or broadly conical apex of the ovaries. Drupes connate in clusters or rarely separate, the clusters collected in a large head.

1. **P. odoratissimus,** *Linn. f. Suppl.* 424.—Stems "from a creeping base arborescent, branched, 15 to 20 ft. high." Leaves 3 to 5 ft. long or on young luxuriant individuals twice as long, 2 to 3 in. broad, acuminate, bordered by small prickles turned upwards. Male inflorescence terminal, recurved, often above 1 ft. long, consisting of about 6 to 20 dense spikes of $1\frac{1}{2}$ to 3 in., each one sessile in the axil of a leafy bract, the lowest of which are often 1 ft. long and nearly resemble the smaller upper leaves, tapering into a long narrow point, the upper ones gradually smaller with shorter points and whiter, but all much longer than the spikes, the margins serrulate, scabrous but scarcely prickly. Stamens exceedingly numerous, densely covering the rhachis, but the filaments united 10 to 20 together in a column often $\frac{1}{2}$ in. long, shortly free only at the ends, with linear anthers of $1\frac{1}{2}$ to 2 lines. Drupes

cuneate, hard and woody, 2 to 3 in. long, very obtuse, connate in clusters of 8 to 20 and these collected in a globular head 6 to 8 in. diameter, the clusters flat and areolate at the top, the apex of each drupe scarcely prominent, and the remains of the stigmas quite flat, the pericarp when old splitting into fibres at the base.—Roxb. Corom. Pl. t. 94 to 96; *P. spiralis*, R. Br. Prod. 341, and the numerous synonyms quoted by S. Kurz in Seem. Journ. Bot 1867, 125, and in Journ. Asiat. Soc. Bengal, xxxviii. 149, under *P. verus*, a Rumphian designation used previous to the establishment of the Linnæan nomenclature.

N. Australia. *R. Brown* (no label in his herbarium); Arnhem's Land and Islands of the Gulf of Carpentaria, *F. Mueller*; Port Darwin, *Schultz, n.* 613; Escape Cliffs, *Hulse*; King's Sound, *Hughan.*

The species is widely spread over tropical Asia and the Malayan Archipelago. The single drupes in F. Mueller's specimens as well as the clusters of drupes are much larger than in the usual Indian specimens as observed by Dr. J. B. Balfour, but they show no character to distinguish them specifically.

2. **P. aquaticus,** *F. Muell. Fragm.* v. 40 and viii. 220.—Differs from *P. odoratissimus*, according to F. Mueller's notes, in the stem emitting no adventitious descending roots, and in the drupes in the head not cohering in clusters. Our specimen consists of leaves only and a male inflorescence, in no respects distinguishable from those of *P. odoratissimus*, and the want of adventitious roots may occur in many species.

N. Australia. Upper Victoria River, *F. Mueller.*

3. **P. pedunculatus,** *R. Br. Prod.* 341.—Stems "emitting stolons at the base, arborescent" (*R. Brown*). Leaves broader than in *P. odoratissimus*, tapering into a long narrow point, the edges prickly. Of the male inflorescence I have only seen loose spikes of 3 or 4 in. on peduncles nearly twice as long, otherwise resembling those of *P. odoratissimus*, the filaments similarly united in columns of about ½ in., the free part shorter than the anthers. Rhachis of the female spike or head very thick, obtusely triangular, 2 to 4½ in. long, on a thick peduncle of 5 in. with the remains of a few leaves or bracts under the head all split into shreds. Drupes in narrow clusters of 7 to 18, about 2 in. long, very hard and smooth outside, apparently not splitting into fibres, the conical apexes of the drupes very prominent at the top, each with the remains of a reniform stigma.

Queensland Port Denison, *Henne*; Rockhampton, *Dallachy* (leaves only, 1 to 1½ in. broad, referred here by F. Mueller).

N. S. Wales. Durval, *Leichhardt* (leaves only, 4 in. broad, referred here by F. Mueller); Richmond River, *Henderson*; Hastings River, *Beckler.*

I found no specimen in Brown's Herbarium, it is given as tropical in the Prodromus.

4. **P. Forsteri,** *Moore and Muell.*; *F. Muell. Fragm.* viii. 220.—Closely resembles *P. odoratissimus* in habit as far as can be judged from

Fitzgerald's sketch in F. Muell. Fragm. vii., as well as in foliage and male inflorescence in as far as shown by the specimens. Stamens more numerous in each cluster in the dense spike, and the filaments only shortly united at the base, some of the outer ones of each cluster free, and all much longer than the anthers which vary from 1 to 1½ lines long. Drupes about 2 in. long, united in clusters of 4 to 7 and fibrous at the base when old as in *P. odoratissimus*, but the convex apex of each drupe more prominent, and the stigma slightly raised above the summit. The whole fruit or head said to be nearly 1 ft. long. Seed as in *P. odoratissimus* laterally attached near the base, the testa thin and brittle. Embryo small, oblong, at the base of the albumen.

N. S. Wales. Lord Howe's Island, *C. Moore*, *Fullagar*.

SECTION II. ACROSTIGMA, Kurz (genus *Fisquetia*, Gaudich.)—Filaments free. Stigmas raised on a conical or oblong acute or acuminate style or apex of the ovary. Drupes free or equally connate at the base.

5. **P. monticola**, *F. Muell. Fragm.* v. 40, vii. 63, *and* viii. 220.—Stem weak, half climbing, attaining 2 in. diameter. Leaves placed as in other species but very long, hanging, bordered by small prickles or serratures. Male inflorescence narrow, the spikes sessile along the rhachis, rather distant, 2 to 3 in. long. Bracts at their base membranous but imperfect in the specimens seen. Stamens crowded, irregularly collected in clusters, but the filaments free or scarcely united at the base. Anthers narrow, fully 3 lines long, finely mucronate. Fruit (only one seen) nearly globular, 2½ in. diameter including the styles. Receptacle ovoid, hollow. Drupes exceedingly numerous, closely packed and slightly cohering, about 5 lines long, the pericarp thick and produced into thick linear-conical or oblong shortly acuminate styles above ½ in. long, with small terminal stigmas. Seeds normal.

Queensland. Rockingham Bay, *Dallachy*.

2. FREYCINETIA, Gaudich.

Flowers diœcious in dense spikes, pedunculate or sessile in the axils of deciduous leafy or small bracts and usually 2 or 3 spikes together at the ends of the branches. Male flowers. Stamens crowded on the rhachis, the filaments all free; anthers small, ovate, adnate, with revolute valves, resembling little globular heads. Female flowers: Ovaries often surrounded by 2 or 3 short staminodia, densely packed on the rhachis, cohering by their membranous almost gelatinous bases, imperfectly divided by 2 or 3 projecting parietal placentæ; stigmas or stigmatic lobes 2 or 3, sessile. Ovules numerous, superposed in 2 series on each placenta. Fruits small and numerous, in ovoid oblong or cylindrical heads, succulent at the top, connate at the base and bursting irregularly. Seeds numerous, oblong, bearing on one or both sides a longitudinal loosely cellular appendage or strophiole.—Straggling or climbing perennials or shrubs with leafy branches. Leaves with numerous parallel veins, their sheathing bases closely embracing the branches and often torn up into shreds or filaments, the floral leaves usually smaller and coloured.

The genus comprises but few species, spread over the islands of the Malayan Archipelago and the Pacific and New Zealand. The common Australian species is also in the Malayan Archipelago, whether the second be the same as any of the extra-Australian ones or not we have at present no means of determining.

Leaves about 6 in. long, shortly acuminate . . . . . . 1. *F. Gaudichaudii.*
Leaves 8 in. to 1 ft. long, tapering into a long subulate point . . . . 2. *F. excelsa.*

1. **F. Gaudichaudii,** *Br. and Benn. Pl. Jav. Rar.* 31, t. 9.—Stems straggling or climbing and rooting, more or less covered with the short sheathing bases of the leaves, the membranous margins of the sheaths often torn up into shreds or filaments. Leaves mostly about 6 in. long and ½ to 1 in. wide, shortly acuminate, with numerous parallel veins, the midrib more prominent, often minutely aculeate as well as the edges. Spikes in our Australian specimens female, ovoid-oblong or sometimes short and almost globular, the longer ones 1 to 1½ in. long when in fruit, on peduncles of ½ to 1 in., about 3 together at the ends of the branches. Ovaries very numerous, closely pressed and cohering by their membranous bases, free in the upper half, with a small terminal area divided more or less distinctly into 2 or 3 stigmas. Fruits bursting irregularly. Seeds numerous, oblong, about ½ line long, the rich brown smooth testa contrasting with the white oblong cellular longitudinal appendages or strophioles, the inner one as large as the rest of the seed the outer one much narrower.

Queensland. East coast within the tropics, *A. Cunningham;* Cape York Peninsula, *Hann's Expedition;* Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy, Thozet;* Port Mackay, *Nernst.*

Also in the Malayan Archipelago.

2. **F. excelsa,** *F. Muell. Fragm.* v. 39.—Leaves 8 in. to 1 ft. long, mostly 3–4 lines broad but dilated at the base into short broad imbricate sheaths, tapering into long subulate points, the edges serrulate-spinulose towards the base as well as the margins of the sheaths. Spikes only seen young and slender, above 1 in. long, and too imperfect for examination.

Queensland. Rockingham Bay, *Dallachy;* Glasshouse Mountains, Moreton Bay, *W. Hill;* Maroochie, *Herb. F. Mueller.*

This is evidently distinct from any species I am acquainted with, but unfortunately the only specimen in fructification is not in a state to admit of examining the structure of the spike.

ORDER CXXXV. AROIDEÆ.

Flowers unisexual or sometimes hermaphrodite, closely packed in a dense simple spike or *spadix,* with a convolute or rarely flat coloured or leaf-like bract or *spatha* at its base. Stamens and ovaries either in different parts of the spadix without perianth or bracts, or stamens 6 or fewer round each ovary, with or without a small scale-like perianth-segment under each stamen; anthers usually 2-celled, sessile or on a thick filament, the cells opening in terminal pores or outwards in longitudinal slits. Ovaries sessile, 1- to 3-celled, with 1 or more ovules in each cell variously attached; stigma sessile or on a short simple style. Fruit a berry. Seeds 1 or few, surrounded by pulp, with an appressed testa; albumen usually copious with an axile embryo, or in a few genera albumen none with a thick embryo and prominent plumula in a terminal groove as in *Naiadeæ*.—Herbs with a perennial tuberous or creeping rhizome and radical leaves and scapes, or with long creeping or climbing or rarely erect stems. Leaves entire or variously divided, sometimes very large, the veins usually pinnate or reticulate, or rarely grass-like leaves with parallel veins.

The order is chiefly tropical, in both the New and the Old World, but is also represented in more temperate regions, especially in the northern hemisphere. Of the six Australian genera five are Asiatic, three of them extending also into Africa, one only is endemic.

Aroideæ have been most carefully worked up in several splendid works by the late H. G. Schott of Vienna, but with an inordinate multiplication both of genera and of species. The genera here included are perfectly distinct from each other, but it is very uncertain how many of Schott's Asiatic and African and even American genera should be included in some of them.

No perianth.—Fowers unisexual, the females at the base of the spadix, the males below a terminal appendage. Leaves and scapes radical. Seeds albuminous.

  A number of neutral filiform organs immediately above the female flowers and a bare interval separating them from the males. Ovary with 1 erect ovule. Leaves entire or 3-lobed . . . . 1. TYPHONIUM.

  Male flowers immediately above the females. Ovary 2-celled, with 1 erect ovule in each cell. Leaves compound . . . . 2. BRACHYSPATHA.

  Male flowers separate from the females by ovoid neutral organs without any bare interval. Ovary 1-celled, with several often numerous ovules. Leaves large, cordate or peltate . . . . . . 3. COLOCASIA.

No perianth. Flowers hermaphrodite or the lower ones without stamens, occupying the whole spadix. Ovary with a small cell and several ovules under a thick mass filled with rhaphides. Stems creeping or climbing. Leaves entire or pinnatifid . . . . 4. RHAPHIDOPHORA.

Perianth of 4 or 6 scales in 2 rows; with a stamen opposite each scale. Flowers hermaphrodite, occupying the whole spadix.

  Flowers 4-merous. Ovary 1-celled with 1 pendulous ovule. Seed albuminous. Leaves radical grass-like . . . . 5. GYMNOSTACHYS.

  Flowers 6-merous. Ovary 3-celled with 1 erect ovule in each cell. Embryo large without albumen. Stem climbing. Leaves distichous, the laminæ articulate on a phyllodineous petiole . . . . 6. POTHOS.

1. TYPHONIUM, Schott.

Spatha contracted above the convolute base, the lamina broad, spreading or recurved. Flowers unisexual, the females at the base of the spadix, with subulate neutral organs immediately above them, the males separated by a bare interval, the spadix terminating in a long thick fleshy appendage. Perianth none. Anthers 2-celled, sessile in pairs (appearing like 4 1-celled anthers), the cells opening in terminal pores (or in species not Australian in slits continued to the base). Ovary sessile or nearly so, 1-celled, with a single erect ovule; stigma peltate, sessile or shortly stipitate. Berry 1-seeded. Albumen copious.—Herbs with a hard tuberous rhizome. Leaves entire or 3-lobed, radical as well as the scape.

The genus is generally spread over the warmer regions of the Old World. It differs from the European group now considered as the typical *Arum*, chiefly in the solitary ovules. The Australian species are, as far as known, endemic.

Leaves entire.	
Leaves linear, 1 ft. long or more	1. *T. liliifolium.*
Leaves ovate or lanceolate, 3 or 4 in. long	2. *T. alismifolium.*
Leaves 3-lobed.	
Lobes lanceolate or ovate-acuminate	3. *T. Brownii.*
Lobes linear	4. *T. angustilobum.*

1. **T. liliifolium,** *F. Muell.; Schott, Prod. Syst. Aroid.* 107.—Leaves linear throughout, 1 to $1\frac{1}{2}$ ft. long, including the petiole, which is sheathing at the base and gradually passes into a lamina, scarcely broader and tapering to a point. Scape about 6 in. high. Spatha with a nearly globular convolute base, the lamina ovate-lanceolate, nearly 6 in. long, tapering to a point. Female spike at the base of the spadix ovoid, about $\frac{1}{2}$ in. long. Neutral organs filiform, recurved, rather numerous. Male spike after a bare interval of about 1 in. cylindrical, about $\frac{1}{2}$ in. long. Appendage considerably thicker, obliquely truncate at the base, narrow conical, acuminate, about $\frac{1}{2}$ in. long. Berry ovoid-globular.—F. Muell. Fragm. viii. 187.

N. Australia. Victoria River, *F. Mueller.* The reference given by Schott and copied by F. Mueller to Hook. Kew. Miscell. 1856, 321, is not quite correct. This plant was only named in manuscript labels by F. Mueller, but is mentioned without a specific name in Hook. Kew. Journ. viii. 329, in a paper of F. Mueller's commencing at p. 321.

2. **T. alismifolium,** *F. Muell. Fragm.* viii. 186.—A smaller plant than the other Australian species, the tuber apparently smaller and not so hard. Leaves undivided, ovate-lanceolate or lanceolate, acuminate, rounded or scarcely cordate at the base, 3 to 4 in. long. Spatha dark purple or almost black inside, 4 to 5 in. long, tapering to a long point and not $1\frac{1}{2}$ in. broad in the broadest part. Flowers in the same relative position as in the other Australian species, the terminal appendage rather long. Berry ovoid-globular, about 2 lines diameter.

Queensland. Rockingham Bay, *Dallachy.*

3. **T. Brownii,** *Schott, Aroid.* 11, t. 15.—Leaf-petiole 6 in. to 1 ft. long, the lamina divided nearly or sometimes quite to the base into 3 narrow or broad lanceolate lobes or segments, the lateral ones horizontally divaricate, 4 to 6 in. long, either nearly equal on both sides or more or less dilated at the base on the lower side, the middle lobe usually rather longer and narrower. Scape shorter than the petiole. Spatha with the convolute base ovoid, the lamina 4 to 5 in. long, very broad, of a deep purple inside. Female spike at the base of the spadix ovoid, about ½ in. long. Neutral organs filiform, recurved. Male spike after a bare interval of about 1 in. cylindrical, about ½ in. long; terminal appendage very oblique at the base, rather thick and about 1 in. long in the typical form.—F. Muell. Fragm. viii. 187; Bot. Mag. t. 6180; *Arum orixense*, R. Br. Prod. 336, but not of Roxb.

Queensland. Burnett River; *F. Mueller;* Rockhampton and neighbourhood, *Thozet*, *Bowman;* Rockingham Bay, *Dallachy.*

N. S. Wales. Port Jackson, *R. Brown;* Hastings River, *Beckler;* New England, *C. Stuart.*

Var. *eliosurum*, F. Muell. Leaf-lobes narrow, terminal appendage of the spadix 2 to 3 in. long.—Manly Beach, *Wilhelmi.*

4. **T. angustilobum,** *F. Muell. Fragm.* x. 66.—Leaf-lobes 3, narrow-linear, 5 to 7 in. long and 1 to 1½ lines broad. All the other characters given apply entirely to the *T. Brownii* var. *eliosurum.*

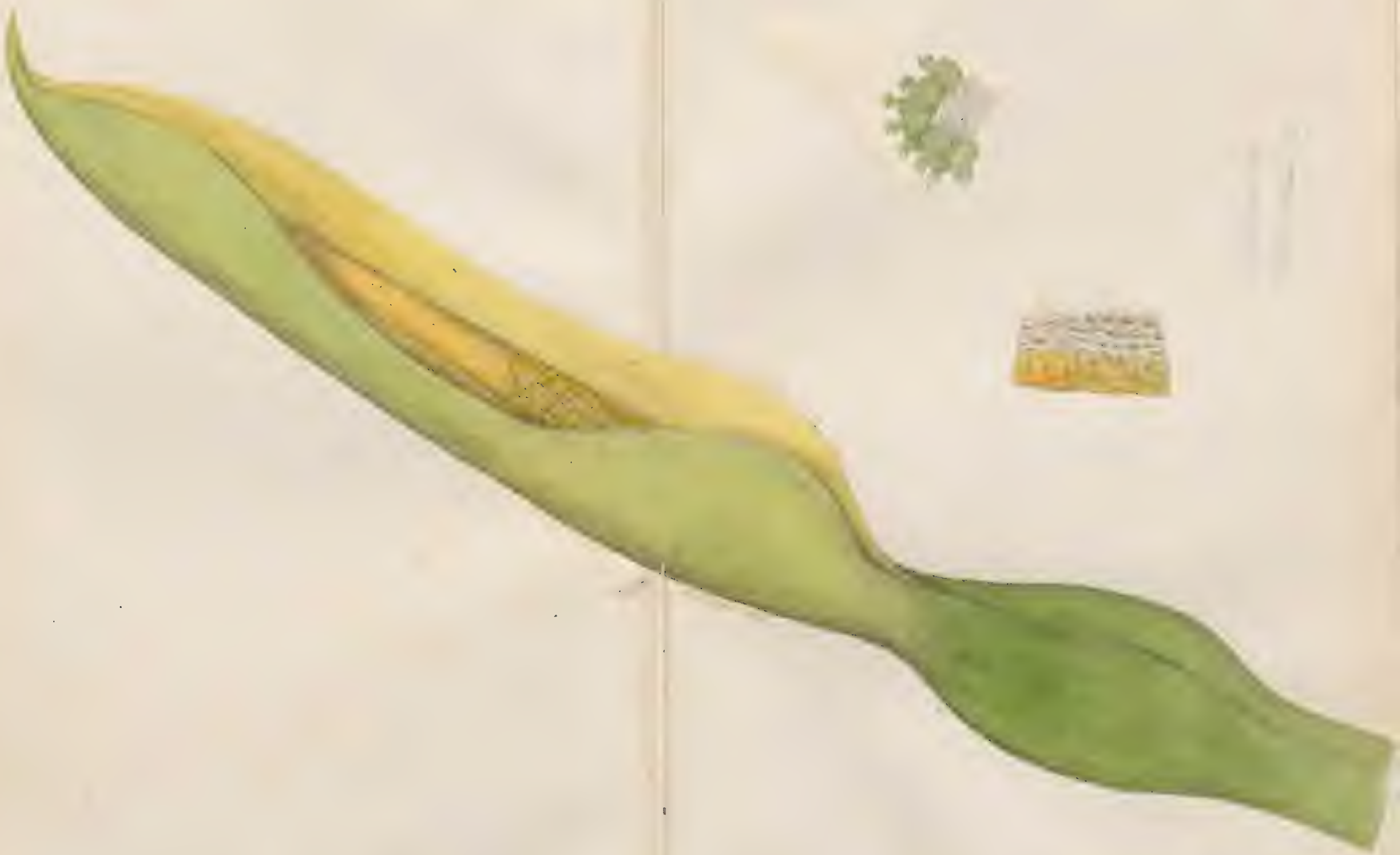
Queensland. Gilbert River, *Armitage.* A single specimen, of which I have been unable to examine the spike.

2. BRACHYSPATHA, Schott.

Spatha broadly convolute at the base, the lamina open, shorter than the spadix. Flowers unisexual, the females at the base of the spadix, the males immediately above them, without the intervention of any neutral organs or bare interval, the sterile end of the spadix long and narrow, continuous with the rhachis. Perianth none. Anthers 2-celled, sessile in pairs (or 4 1-celled), the cells opening in terminal pores. Ovary sessile or nearly so, 2-celled, with 1 erect ovule in each cell. Stigma peltate-capitate, on a very short style. Berry usually 1-seeded. Seed albuminous.—Herbs with a broad depressed tuberous rhizome. Leaves radical, compound. Scapes radical, with 2 or 3 sheathing scales at their base.

The genus as limited by Schott comprises very few species from Ceylon and the Archipelago, of which the Australian species is one.

1. **B. variabilis,** *Schott, Syn. Aroid.* 35.—Leaf-petiole often above 1 ft. long, the common rhachis divided into 3 branches, each branch once or twice bifid, the whole lamina expanding to 1 ft. diameter or more, bearing both above and below the forks a few very unequal segments, mostly acuminate, some oblong-elliptical and 3 to 4 in. long, others ovate and 1 in. or shorter, all membranous, penniveined with rather numerous fine veins, tapering at the base and shortly petiolulate



or sessile and decurrent. Scape above 1 ft. Spatha acuminate, spreading, 4 to 5 in. long. Flowering portion of the spadix about 2 in., the male part much longer than the female, the terminal appendage narrow, slightly fusiform, often 8 to 10 in. long or even more.—*Amorphophallus variabilis*, Blume, Rumphia, i. 146, t. 35.

N. Australia. North coast, *R. Brown*; Port Darwin, *Schultz*, *n.* 562.

The species is also in the Malayan Archipelago. R. Brown, Prod. 337, referred the leaves of this plant, which he had gathered on the North Coast, to *Dracontium polyphyllum*, to which he gave the floral characters derived from other sources. There is indeed a striking resemblance between the leaves of the two plants, requiring a close comparison of the venation to distinguish them. The genus *Dracontium* however, with very different flowers, is hitherto only known from tropical America and west tropical Africa.

3. COLOCASIA, Schott.

Spatha with a convolute persistent base, the lamina long lanceolate deciduous. Flowers unisexual, the females at the base of the spadix separated from the males by short ovoid neutral organs without any bare interval, the barren terminal appendage above the males usually very short and sometimes obsolete. Perianth none. Anthers usually 4 or 2, 2-celled (or 8 or 4, 1-celled) the cells opening in terminal pores. Ovary 1-celled, with several, often numerous ovules, on a parietal placenta; stigma peltate, on a very short thick style, or almost sessile. Berries small, enclosed in the persistent base of the spatha, with several often numerous seeds. Albumen copious.—Scapes and leaves radical, the lamina often very large, cordate or peltate, undivided.

The genus as limited by Schott consists of very few species from the warmer regions of the Old World. The two Australian species are also widely dispersed in tropical Asia and one of them is very extensively cultivated.

Leaves peltate. Ovules numerous . . . . 1. *C. antiquorum.*
Leaves broadly hastate-cordate. Ovules rather few . . . 2. *C. macrorrhiza.*

1. **C. antiquorum,** *Schott, Meletem.* 18; *Prod. Syst. Aroid.* 138.—Leaves ovate, more or less peltate and cordate, often above 1 ft. long and broad, the primary veins pinnate and pedate at the base of the leaf, the transverse veinlets arcuate and confluent in the centre of each interval. Persistent convolute base of the spatha ovoid-oblong, usually about 1½ in. long, the lamina 6 in. long or more. Spadix much shorter, the female base ¾ to 1 in. long, the neutral part shorter, the male portion rather longer, the terminal appendage much shorter and sometimes obsolete. Stigmas almost sessile.—F. Muell. Fragm. viii. 187; Wight, Ic. t. 786; *Caladium acre*, R. Br. Prod. 336.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*. The species is much cultivated in tropical Asia and Africa, and often gathered as wild, but its real native country is not well ascertained.

2. **C. macrorrhiza,** *Schott, Meletem.* 18.—Leaves often 2 ft. long

or more, very broadly hastate-cordate, with the venation of *C. antiquorum*, but not at all or only very slightly peltate. Spatha and spadix very similar to those of that species as far as can be ascertained from imperfectly dried specimens, the laminæ of the spatha rather broader and the terminal appendage of the spadix longer. Anthers usually 2, 2-celled (or 4, 1-celled) to each flower or cluster. Ovary 1-celled, with fewer ovules than in *C. antiquorum*, and all attached at or near the base of the cavity. Stigma nearly sessile, broad, peltate or slightly lobed. Berries ovoid, 2 or 3 lines long, usually ripening 3 or 4 seeds.—F. Muell. Fragm. viii. 187; *Caladium macrorrhizon*, R. Br. Prod. 336, *Alocasia macrorrhiza*, Schott, Prod. Syst. Aroid. 146.

Queensland. Ipswich, *Nernst.*; Rockhampton, *Thozet*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan.*

N. S. Wales, Hastings River, *Beckler*; Richmond River, *Mrs. Hodgkinson.*

I have not found any specimen in Brown's herbarium. The species is widely spread over tropical Asia and the Pacific Islands.

4. RHAPHIDOPHORA, Hassk.

Spatha open to the base, usually very deciduous. Flowers hermaphrodite or the lower ones without stamens, in a cylindrical spike covering the whole of the spadix. Perianth none. Stamens 4 to 6, adnate to the sides of the ovary, or the anther-cells free, opening outwards in longitudinal slits. Ovary with a thick angular fleshy truncate apex filled with raphides inside, and a small basal cavity, 1-celled or imperfectly 2-celled, with few ovules; stigma adnate to the centre of the truncate apex. Seeds albuminous.—Stems climbing on trees and rooting in the lower part. Leaves large and deeply pinnatifid or in species not Australian smaller and entire.

The genus as limited by Schott comprises a few species from East India or the Malayan Archipelago, one of which is also the Australian one.

1. **R. pinnata,** *Schott in Bonplandia*, v. 45; *Prod. Syst. Aroid.* 384.—Stems climbing on trees to a great height. Leaves often 3 ft. long and 1 ft. broad, deeply pinnatifid or almost pinnate, the segments lanceolate falcate with more or less incurved points, sometimes connected to about $\frac{1}{2}$ in. from the centre, sometimes distinct almost to the rhachis, the terminal ones often united in a large broad lobe, all except the lowest penniveined with a prominent central nerve and fine oblique veins starting from it, and also numerous fine veins starting from the general midrib or rhachis of the leaf, the lower lobes sometimes with only the fine veins, the base of the leaf cordate truncate or almost acute. Spatha very deciduous; leaving a cylindrical spike of 3 or 4 in., but very imperfect in the Australian specimens seen.—*R. vitiensis* and *R. Cunninghamii*, Schott, in Bonplandia, ix. 367.

Queensland. *A. Cunningham*; Rockingham Bay, *Dallachy*; Fitzroy Island, *Walter*; Port Denison, *Fitzalan.* The species is also in the Malayan Archipelago and the South Pacific Islands.

Schott distinguishes the three species cited above by the venation, the depth of the lobing, and the cordate or non-cordate base of the leaf, differences which may be seen in different leaves of the same gathering. The Australian specimens, although rather numerous, are very unsatisfactory as to the flowers, with two only of them are detached portions of the spike, in one, probably not yet in full flower, the anthers are oblong with parallel cells on the side of the thick apex of the ovary, in the other there remain only a few anthers with short divaricate anthers shortly protruding above the ovary. The stigma is oblong, adnate to the centre of the truncate apex.

5. GYMNOSTACHYS, R. Br.

Flowers hermaphrodite, loosely packed in slender spikes without any or with a very minute spatha. Perianth of 4 scale-like segments in 2 series. Stamens 4, opposite the segments; filaments short, thick, somewhat compressed; anthers 2-celled, terminal, the cells opening outwards. Ovary oblong, 1-celled, with 1 ovule suspended from the apex; stigma sessile. Berry ovoid or globular. Seed with an appressed rather thin testa. Embryo short, in the axis of a rather hard albumen; radicle superior.—Herb with tuberous roots and very long grass-like radical leaves. Spikes clustered in the axils of leafy bracts along a tall otherwise leafless scape.

The genus is limited to the single species endemic in Australia.

1. **G. anceps,** *R. Br. Prod.* 337.—Roots swollen into fusiform tubers. Radical leaves erect, rather rigid, strongly nerved, 1 to 3 ft. long, and usually 3 to 4 lines broad. Scapes nearly as tall, much flattened, with acute smooth or serrulate-scabrous edges. Clusters of spikes usually 3 or 4, distant from each other in the upper part of the spike, the leafy bract subtending the cluster rigid erect and shorter than the spikes. Spikes usually 2 or 3 rarely more in each cluster, on short peduncles with 2 or 3 sheathing scales at the base of each peduncle, the slender spikes very unequal, the longest often 2 to 3 in. Flowers small, sessile but not closely packed. Perianth-segments or scales obovate, truncate, not exceeding the ovary. Berries 3 or 4 lines long.—Schott, Gen. Aroid. t. 97; F. Muell. Fragm. viii. 187.

Queensland. Moreton Bay, *Backhouse*, *F. Mueller* and others; Condamine River, *Hartmann*; Rockhampton, *Bowman*, *Thozet*.

N. S. Wales. Hunter and Paterson Rivers, *R. Brown*; New England, *C. Stuart*; Hastings River, *Fraser*, *Beckler*; Clarence River, *Wilcox*; Richmond River, *Henderson*; southward to Illawarra, *A. Cunningham*; Kiama, *Harvey*.

6. POTHOS, Linn.

Spatha ovate or lanceolate, concave or flat, at length reflexed or deciduous. Flowers hermaphrodite, covering the whole spadix. Perianth of 6 obovate or cuneate concave segments or scales, in 2 series. Stamens 6 or fewer, opposite the segments; filaments flattened; anthers terminal, 2-celled, the cells opening outwards. Ovary ovoid or obovoid, 3-celled, with 1 erect ovule in each cell; stigma sessile. Berry often 1-seeded by abortion. Seed without albumen, the testa membranous but rather thick. Embryo thick and hard, with a cavity in the upper end enclosing a prominent plumula and a small cotyledonous end curved over it.—Tall climbers. Leaves usually distichous with the lamina articulate on a phyllodineous petiole. Spikes (or spadices) cylindrical or globular, terminal, or if axillary the peduncle enclosed at the base in two or more sheathing bracts.

The genus as now limited extends over tropical Asia to South China and westward to Madagascar, the only Australian one proving to be the same as one from the Philippine Islands and South China.

1. **P. Loureiri,** *Hook. and Arn. Bot. Beech. Voy.* 220.—A glabrous climber, clinging to the stems of trees and sometimes covering the tallest of them. Leaves exceedingly variable in the Australian specimens, the phyllodineous petiole sometimes linear-lanceolate 5 or 6 in. long, not 3 lines wide and rounded at the end, without any or only a very small lamina, and passing gradually from that to oblanceolate, 1½ to 4 in. long, 3 to 9 lines broad at the upper end, where it is rounded or truncate or broadly or deeply obcordate, the lamina from ovate-acuminate to lanceolate, almost always shorter than the petiole but sometimes longer by 2 in., narrower or rarely broader than the petiole, rounded or narrowed at the base. Spikes shortly pedunculate, cylindrical, 1 to 2 in. long when in flower, sometimes nearly 3 in. when in fruit. Spatha lanceolate, varying from shorter to rather longer than the spadix. Berry red, oblong or ovoid, 5 to 6 lines long.—Schott, Aroid. 23, t. 49; *P. longipes*, Schott, Aroid. 23, t. 47 (there placed in the wrong section from not having seen the fructification, but correctly transferred in Prod. Syst. Aroid. 568); *P. cylindricus*, Presl, Schott, Aroid. 23, t. 48; *P. australasicus*, F. Muell. Fragm. i. 62.

Queensland. Moreton Bay, *F. Mueller;* Pine River, *W. Hill;* Port Mackay, *Nernst;* Rockingham Bay, *Dallachy;* Mount Dryander, *Fitzalan.*

N. S. Wales. Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler* and others; Bellinger River, *C. Moore;* Tweed River, *Guilfoyle.*

The species is also in the Philippines and South China. The characters by which Schott sought to distinguish the Chinese *P. Loureiri* and the Philippine Island *P. cylindricus* from the Australian plant, are all to be met with in one or another of the Australian specimens. The species has sometimes the foliage of the common *P. scandens*, but is readily distinguished by the spike, elongated and cylindrical, not globular or ovoid.

ORDER CXXXVI. TYPHACEÆ.

Flowers unisexual; very closely packed in separate heads or spikes along a common rhachis, the upper ones males, the lower females, intermixed in the spikes with linear or spathulate scales or long hairs, often forming more or less definite perianths around the stamens or ovaries. Stamens 3 or fewer to each flower; anthers erect, narrow, the cells placed back to back and opening in longitudinal slits. Ovary of a

single carpel, containing a single pendulous ovule, and tapering into a simple style, with an adnate unilateral stigma. Fruit a small 1-seeded nut, with a membranous or drupaceous pericarp. Seed pendulous, with a membranous testa, and mealy albumen. Embryo axile, linear, straight, with a superior radicle.—Reed-like marsh or aquatic herbs, with long linear parallel-veined leaves, sheathing at the base.

The Order is limited to the two genera represented in Australia and both of them widely distributed over the globe, especially in temperate regions.

Flowers in cylindrical spikes, the females enveloped in a soft dense copious down formed of numerous long capillary bristles . . . . 1. Typha.
Flowers in globular heads, the ovaries surrounded by about 6 linear scales or perianth-segments . . . . 2. Sparganium.

1. TYPHA, Linn.

Spikes cylindrical, the upper male portion contiguous with the lower female portion, or separated from it by a bare interval. Stamens in the male portion intermixed with filiform or slightly spathulate scales. Ovaries in the female portion surrounded by tufts of long hairs, affixed to the stipes, falling off with the fruit and assuming the aspect of a pappus at its base.

The genus consists of very few species widely spread over the temperate regions of the globe, especially in the northern hemisphere, and found also within the tropics both in the new and the old world; the single Australian one, which is also in New Zealand, although specifically distinguished by some botanists, appears to be really identical with one of the common northern and tropical ones.

1. **T. angustifolia,** *Linn.; Kunth, Enum.* iii. 9. Stems erect, 2 to 4 ft. high in some localities, attaining 8 to 12 ft. in West Australia according to Oldfield. Leaves often as long as or longer than the stems, mostly about 3 lines but sometimes above 4 lines broad, the dilated margins of the lower ones forming a sheath of 6 in. to 1 ft. Female spike a soft dense brown cylindrical cushion, 3 to 5 or rarely 6 in. long, 3 or 4 lines diameter at the time the male is in flower, thickening out to $\frac{3}{4}$ or nearly 1 in. diameter as the fruit ripens. Male spike usually at an interval of $\frac{1}{2}$ to 1 in. from the female, very rarely close above it. Male flowers consisting of 2 or 3 linear anthers sessile on a short common stipes, the cells crowned by the hemispherical end of the connective, the flowers surrounded by filiform or slightly spathulate scales shorter than the anthers. Ovaries in the female spike fusiform, concealed as well as the fruits among the long hairs irregularly inserted on the short stipes, and tapering into a style rarely as long as those hairs. Fruits small, obovoid or fusiform, contracted into a stipes, the thin membranous pericarp free from the seed.—R. Br. Prod. 338; Hook. f. Fl. Tasm. ii. 39.

N. Australia. Port Essington, *Armstrong*; in the interior, *M‘Dougal Stuart's Expedition.*

Queensland. Moreton Ireland, *M‘Gillivray*; Rockhampton, *Thozet* and others.

N. S. Wales. Port Jackson, *R. Brown*; Richmond River, *Mrs. Hodgkinson.*

Victoria. Mitta Mitta, *F. Mueller*; Wimmera. *C. Green.*

Tasmania. *R. Brown*; common in marshes or banks of rivers, etc., *J. D. Hooker.*

W. Australia. Swan River, *Preiss, n.* 1874; Murchison River, *Oldfield.*

The species is generally distributed over the area of the genus.

I have found no specimens in Brown's herbarium and I give his stations from the Prodromus. Lehmann, in Pl. Preiss. ii. 3, refers Preiss's specimen, which has the male and female spikes exceptionally contiguous, to the European *T. Shuttleworthii*, Sond., with which Rohrbach asserts that it has no connection. Rohrbach, on the other hand distinguishes under the name of *T. Muelleri* (Rohrb. in Verhandl. Bot. Verein Brandenb. 1869, 95) the majority of the Australian specimens, chiefly from the texture of the testa of the seed, in which he finds the cells of the external layer much broader than long, instead of being equally long and broad, a histological character of no practical use. I cannot confirm the other distinction given in the shape of the stigma, which varies in being rather more or less decurrent on the style in the European as in the Australian plant.

2. SPARGANIUM, Linn.

Flowers in globular heads distant from each other along the rhachis, one or more upper ones male and sessile, the lower ones female and sessile or the lowest pedunculate. Stamens in the males though very closely packed yet more or less distinctly in threes, surrounded by about 6 linear or spathulate scales; anthers small, oblong or linear, on filaments longer than the scales. Ovaries in the females nearly sessile, each surrounded by about 6 linear scales, tapering into a style projecting beyond the scales. Fruits obovoid or fusiform, contracted at the base and usually falling off with the surrounding scales. Pericarp drupaceous, with a thin epicarp and hard indehiscent endocarp.

The genus, like *Typha*, consists of a small number of species widely spread over the northern hemisphere, but the Australian species which is also in New Zealand, though nearly allied to one of the northern ones, appears to be distinguishable by characters that may be regarded as specific.

1. **S. angustifolium,** *R. Br. Prod.* 338, *not of Michx.* —Stems from a shortly creeping rhizome erect, not very stout, 1 to 2 ft. high or rarely more. Lower and radical leaves very long, mostly 1 to 2 lines broad, the midrib acutely prominent underneath, the lower portion expanding into long many-nerved rather narrow sheaths. Inflorescence simple or with one short branch in the axil of the uppermost leaf, with leafy bracts under several of the lower heads. Heads few or numerous, all sessile or the lowest one pedunculate. Filaments of the males about twice as long as the scales. Ovaries in the females tapering into a thick style, with the stigma decurrent about halfway down. Fruits

sessile or nearly so, broadly obovoid, very obtuse, mucronate with the persistent remains of the style.

Queensland. Brisbane River, Moreton Bay, *F. Mueller* and others.
N. S. Wales. Port Jackson, *R. Brown* (no label in his herbarium); Richmond, *Woolls*; New England, *C. Stuart*; Hastings River, *Beckler.*
Victoria. Yarra, Lake Omeo, Mount Emu Creek, and Ovens River, *F. Mueller.*

This plant has the simple inflorescence foliage and habit of the erect varieties of the northern *S. simplex*, but has not the narrow acuminate fusiform fruit of that species. The fruit is more like that of *S. ramosum* but smaller.

Var.? *latifolium.* Leaves about ½ in. broad and the inflorescence sometimes slightly branched, the specimens not yet in fruit.—N. S. Wales, *Leichhardt*, *Woolls*, *Oldfield.* These specimens seem to show some approach to the common northern *S. ramosum.* Can they have been introduced?

ORDER CXXXVII. LEMNACEÆ.

Floating plants, without distinct stems or real leaves, but consisting of small sometimes minute leaflike fronds, either separate or cohering 2 or 3 together by their edges, emitting in most species one or more fibres from their under surface into the water, and multiplying by similar fronds growing out of their edges. Flowers very rare, appearing from a fissure in the edge or upon the upper surface of the frond, and consisting of a minute membranous bract or spatha, enclosing 1 or 2 stamens and a single ovary. Perianth none. Filaments usually shortly exserted, anther 1- or 2-celled. Ovary 1-celled, with 1 or more ovules. Style short, with a slightly thickened stigma. Fruit a minute utricle. Seeds 1 or more, with or without albumen.

The Order, usually limited to the two genera represented in Australia, is widely spread over the globe in ponds or standing waters. The Australian species, if correctly identified, have all a wide range, at least in the Old World. There is however considerable difficulty in determining many of the specimens preserved in herbaria, as they are not in fructification. The Lemnaceæ have indeed been recently worked up with great care by Professor F. Hegelmaier, of Tübingen, in an elaborate treatise illustrated by 16 plates (Die Lemnaceen, Leipzig. 1868, 4to), but the characters given to distinguish the species independently of the fructification cannot well be practically ascertained without a patient study with the aid of a powerful microscope. I have therefore here confined myself to the more obvious distinctions of the principal species without entering into the minute particulars by which some of the Australian forms might be separated, referring for further details to Hegelmaier's work, which must be consulted by all those who would make a special study of these curious organisms.

Fronds minute, emitting no fibres, flowering in a cavity on the
upper surface . . . . 1. WOLFFIA.
Fronds emitting from their under surface one or more fibres,
and flowering in a fissure of the margin . . . . 2. LEMNA.

1. WOLFFIA, Horkel.

Fronds minute, emitting no fibres. Flowers bursting from a cavity on the upper surface of the frond, without any spatha or bract. Anther 1, globular, nearly sessile, opening in 2 valves. Ovary globular with a single erect ovule; style short with a broad stigma.

1. **W. arrhiza,** *Wimm.; Hegelm. Lemn.*, 124, t. 2, 3, var. *australiana*.—Fronds mostly about ½ line diameter, as broad as long, very thin except the thickened side whence the new frond arises, whilst in the typical *W. arrhiza* they are scarcely above ¼ line diameter and thick all over. Fructification of the Australian form unknown.—*Lemna arrhiza*, Linn.; *Wolffia Michelii*, Schleid.; F. Muell. Fragm. viii. 187.

Victoria. Mount Emu Creek, where it is not mixed with other Lemnaceæ, Lake Towang and swamps near Mount Gilibrand, mixed with *Lemna minor*, *F. Mueller*.

F. Mueller, Fragm. viii. 188 informs us that Hegelmaier, to whom he appears to have communicated specimens of the plant, could not in the barren state of the fronds safely distinguish it from *W. arrhiza*, although it looks very different from all our specimens of that species whether from Europe or East India. I do not find however any single frond attaining 1 to 1½ lines as described by F. Mueller, nor any one twice as long as broad, though here and there two fronds are closely joined together so as almost to look like one.

2. LEMNA, Linn.

Fronds emitting one or more root fibres from their under surface. Flowers issuing from a fissure in the margin of the frond. Anthers with 2 distinct cells, each opening in two valves, at the end of a distinct filament. Style short or more or less lengthened.

Geographical distribution that of the Order.

Root-fibres one to each frond.
  Fronds very thin, oblong or narrowed at one end, the young ones often projecting on each side at both ends. Ovule 1 . . . . 1. *L. trisulca.*
  Fronds broadly ovate, rather thin, slightly convex underneath, the young ones soon detached from one side. Ovule 1 . . . . 2. *L. minor.*
  Fronds of *L. minor* but rather thicker. Ovules 2 or more . . . . 3. *L. gibba.*
Root-fibres several in a cluster under each frond.
  Fronds thin, oval or oblong, rarely above 2 lines long . . 4. *L. oligorrhiza.*
  Fronds herbaceous, usually orbicular and nearly 3 lines diameter . . . . 5. *L. polyrrhiza.*

1. **L. trisulca** *Linn.; Hegelm. Lemn.* 134, t. 5, 6.—Fronds oblong or lanceolate, often ½ in. long and about half that breadth, thin, narrow and minutely toothed at one end and ending in a little stalk at the other, with 2 young ones usually growing from opposite sides and remaining long adherent, and emitting a single root

from underneath. Stamens usually 2. Ovary with 1 ovule and a very short style.—R. Br. Prod. 345; Hook. f. Fl. Tasm. ii. 38; F. Muell. Fragm. viii. 188.

N. S. Wales. Port Jackson, *R. Brown*; sources of the Gwydir, *Leichhardt.*
Victoria. Murray River, *F. Mueller.*
Tasmania, *R. Brown*; in still waters, but less frequent than *L. minor*, *J. D. Hooker.*

Common in the northern hemisphere. Brown's stations for this and the following species are taken from his Prodromus, I have not seen his specimens.

2. **L. minor,** *Linn.*; *Hegelm. Lemn.* 142, t. 9, 10.—Fronds usually broadly ovate, about 2 lines long, rather thin, emitting a single root from the under surface, the young frond growing from one side, becoming soon detached. Stamens usually 2. Ovary with a single ovule.—R. Br. Prod. 345; Hook. f. Fl. Tasm. ii. 38; F. Muell. Fragm. viii. 188.

Queensland. Rockhampton, *O'Shanesy*, *Bowman*; Brisbane, *Bailey.*
N. S. Wales. Port Jackson, *R. Brown.*
Victoria. In the Yarra, *F. Mueller.*
Tasmania, *R. Brown*; abundant, *J. D. Hooker.*
W. Australia, *Drummond?*

The commonest species in most parts of the area of the genus.

3. **L. gibba,** *Linn.*; *Hegelm. Lemn.* 145, t. 11, 12.—Fronds of the size and shape of those of *L. minor* and similarly emitting a single root from the underside, but much thicker, convex underneath, and the ovary has 2 or more ovules.

W. Australia, *Oldfield*, *Drummond*, *n.* 178?

Widely spread over the area of the genus, but not so common as *L. minor.*

Oldfield's specimens have a few flowers and Hegelmaier appears to have examined them and ascertained them to belong to *L. gibba.* Drummond's specimens are precisely similar, with the same thick fronds but are not in fructification. Hegelmaier has named one patch of them in herb. Hooker *L. paucicostata* (Hegelm. Lemn. 139. t. 8), which he distinguishes from *L. minor* chiefly upon histological characters which I have been unable fully to appreciate, and the majority of the specimens (chiefly East Indian) named by him *L. paucicostata*, certainly appear to me to be referrible to the common thin-fronded *L. minor.*

4. **L. oligorrhiza,** *Kurz*; *Hegelm. Lemn.* 147, t. 16.—Fronds thin, oval or oblong, resembling those of *L. minor*, but usually rather larger though rarely much above 2 lines long, 3- or 5-nerved, and emitting from the underside a cluster of several roots or fibres, usually 2 to 5 but sometimes more. Fructification unknown.—*L. pleiorrhiza* and *L. melanorrhiza*, F. Muell.; Kurz in Seem. Journ. 1867, 115.

Queensland, *Bowman.*
N. S. Wales. Paramatta, *Woolls.*
Victoria. Entrance of the Murray River, *F. Muell.*

The species appears to be spread over East India and the Malayan Archipelago

5. **L. polyrrhiza,** *Linn.*—Fronds very broadly ovate or most frequently orbicular, mostly nearly 3 lines diameter, rather thin but more herbaceous than most species and often darker coloured, emitting from the underside a cluster of several often many fibres. Fructification only very imperfectly known, the ovary said to have 2 erect ovules.—*Spirodela polyrrhiza,* Hegelm. Lemn. 151. t. 14, 15.

N. S. Wales, *Leichhardt.*
Victoria. Lagoons of the Towang, *F. Mueller.*

Generally spread over the area of the genus, though not so common as *L. minor.* Appears to be rather frequent in East India.

ORDER CXXXVIII. **NAIADEÆ.**

Flowers hermaphrodite or unisexual, regular or very imperfect. Perianth of 6, 4 or 3 small scale-like segments or rudimentary or none. Stamens 6 or fewer; anthers erect, sessile or nearly so at the base of the segments or on the receptacle, usually 2-celled, opening outwards in longitudinal slits. Ovary of 6 or fewer carpels, distinct or rarely more or less connate or solitary, tapering into distinct entire or branched styles or with sessile stigmas; ovules 1 or rarely several in each cell, laterally attached at or above or rarely below the middle. Fruit of 6 or fewer or single indehiscent nutlets, or rarely follicular carpels opening inwards in a longitudinal slit. Seed attached at or below the summit, straight curved or more or less coiled, with a thin testa and no albumen. Embryo the shape of the seed or more coiled or hooked at the upper cotyledonous end, the plumula frequently prominent from a dorsal cavity.—Aquatic floating or submerged plants or rarely erect marsh herbs with radical leaves. Flowers small, usually green, in spikes heads or solitary, on axillary peduncles or radical scapes, or entirely enclosed in the sheathing bases of floral leaves or bracts.

The Order, like *Alismaceæ,* is represented in the marshes, ponds, and shallow waters of most parts of the world, and includes some exclusively marine genera as widely dispersed. Of the nine Australian genera six have a very wide range over the waters of both hemispheres, two are limited to the shores of the Old World, and one only, *Lepilæna,* is endemic. The deficiency or very reduced state of the perianth and sessile anthers opening outwards readily distinguish the order from *Alismaceæ,* which are otherwise its nearest allies.

TRIBE I. **Potameæ.** *Flowers hermaphrodite. Anthers short and broad, sessile at the base of the scale-like perianth-segments. Carpels* 3 *to* 6, 1-*seeded.*

Flowers usually 3-merous or 6-merous. Carpels frequently cohering till ripe. Marsh or aquatic plants, with erect scapes and erect grasslike or rarely floating leaves . .	1. TRIGLOCHIN.
Flowers usually 4-merous. Carpels free. Aquatic plants with submerged or floating stems and leaves and axillary peduncles	2. POTAMOGETON.

TRIBE II. **Zostereæ.** *Flowers hermaphrodite or unisexual. Perianth none or rudimentary or in one sex only. Carpels* 1 *to* 3 *or rarely more,* 1-*seeded or rarely several-seeded. Aquatic submerged plants, mostly marine or subsaline.*

Flowers hermaphrodite, spicate. Leaves alternate.
  Spikes enclosed when young in the sheathing bases of floral leaves. Stamens 2. Carpels 2 at first sessile, but when in fruit on long stalks . . . . 3. RUPPIA.
  Spikes several on a long scape, each with 2 sheathing bracts at the base in the axils of a floral-leaf. Stamens 3. Carpel 1, sessile. Marine plant . . . . 4. POSIDONIA.
Flowers unisexual, spicate. Leaves alternate. Spikes androgynous enclosed in the base of floral leaves.
  Stamens and carpels solitary . . . . 5. ZOSTERA.
Flowers unisexual, solitary within the sheathing bracts. Leaves alternate. Anthers 2 or 3, dorsally connate.
  Anthers 2. Carpels 2. Marine plants . . . . . . 6. CYMODOCEA.
  Anthers and carpels usually 3. Subsaline aquatic plants 7. LEPILÆNA.
Flowers unisexual, solitary. Leaves opposite. Carpels solitary.
  Anther 1. Carpel 1-seeded . . . . 8. NAIAS.
  Anthers 3. Carpel several-seeded . . . . 9. HALOPHILA.

TRIBE I. POTAMEÆ.—Flowers hermaphrodite. Anthers short and broad, sessile at the base of the scale-like perianth-segments. Carpels 3 to 6, 1-seeded.

1. TRIGLOCHIN, Linn.

(Cycnogeton, *Endl.* Maundia, *F. Muell.*)

Flowers hermaphrodite or rarely polygamous. Perianth-segments scale-like, 3, 6 or fewer. Stamens as many or fewer, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels normally 6, but 3 alternate ones sometimes reduced to empty laminæ, all more or less united in the axis at the time of flowering or distinct from the first, the short terminal styles or stigmas always distinct. Ovules solitary in each carpel, laterally attached below the middle. Fruit of 6 or 3 indehiscent deciduous 1-seeded nutlets, the 3 empty carpels of some species remaining attached to a central axis and assuming the appearance of dissepiments of a capsule. Seed erect, cylindrical or ovoid, the testa membranous; embryo straight, the shape of the seed.—Marsh or aquatic herbs. Leaves all in radical tufts, linear or filiform. Scapes erect, simple and leafless, bearing a terminal spike of small flowers sessile or shortly pedicellate, without bracts.

The genus is spread over a great part of the globe, but mostly in extratropical or subtropical regions. Of the 5 Australian species, one is generally spread over northern as well as southern temperate and subtropical America, South Africa, and New Zealand, the others appear to be all endemic. *Triglochin*, with its nearest ally *Scheuchzeria*, forming the tribe of *Juncagineæ* is usually placed under or next to, *Alismaceæ*, but it appears to me to be much more nearly connected with *Potamogeton*. in the peculiar structure of the flowers, differing chiefly in habit, and even in that respect, the half-floating leaves of *T. procera* show a near approach to that genus. The generic name has been generally, after the example of Linnæus and others, treated as neuter, but modern purists have called attention to the feminine gender of the Greek word from which it is derived.

SECT. I. **Eutriglochin.**—*Fruits with 3 perfect deciduous nutlets, leaving a central* *axis with 3 thin barren carpels resembling dissepiments. Stamens usually 3 perfect or in the terminal flower* 6.

Stock stoloniferous. Scape usually 3 in. to nearly 1 ft. high.
  Fruit nearly orbicular . . . . 1. *T. striata.*
Dwarf plants without stolones. Scape usually under 3 in. high.
  Fruit narrow, the perfect carpels with an angle or short spur at the base . . . . 2. *T. centrocarpa.*
  Fruit broadly obovate or angular-turbinate, truncate at the top with the outer angles mucronate . . . . 3. *T. mucronata.*

SECT. II. **Cycnogeton.**—*Fruits with* 3 *to* 6 *perfect nutlets, without any barren ones or persistent axis. Stamens usually* 6, *rarely* 4 *or* 5.

Scapes 1 to 3 ft. high. Leaves long. Carpels 6, rarely 3, more or less united, at least when in flower or rarely free from the first . . . . 4. *T. procera.*
Scapes tall, with a sheath at the base. (Leaves none?). Carpels 2 or 3, united to the apex, at least when in flower. Nutlets almost drupaceous . . . . . . 5. *T. Maundii.*

SECT. I. EUTRIGLOCHIN.—Fruits with 3 perfect deciduous nutlets, leaving a central axis with 3 thin barren carpels resembling dissepiments. Stamens usually 3 perfect or in the terminal flower 6.

1. **T. striata,** *Ruiz et Pav. Fl. Per. et Chil.* iii. 72.—Rootstock small, stoloniferous. Leaves from narrow-linear and about 1 line broad to almost filiform, very variable in length but almost always shorter than the scape. Scape from 2 or 3 in. to nearly 1 ft. high, flowering from below the middle. Flowers shortly pedicellate, often very numerous. Outer perianth-segments broadly ovate, about ¾ line long, the inner ones smaller and narrower or sometimes wanting. Perfect anthers 3 at the base of the outer segments, those at the base of the inner segments fleshy and without pollen or deficient and some flowers occasionally without any anthers. Fruits orbicular or nearly so, 1 to 1¼ lines long, with 6 prominent angles or ribs, 3 larger ones being perfect carpels, laterally compressed with 1 or 3 dorsal ribs, and falling off at maturity, leaving 3 thin empty carpels united to the central axis and having then the appearance of the dissepiments of a 3-celled capsule.—F. Muell. Fragm. vi. 83; *T. decipiens,* R. Br. Prod. 343; *T. filifolium,* Sieb. in Spreng. Syst. Cur. Post. 142, also of Hook. Ic. Pl. t. 579; *T. triandrum,* Mich. Fl. Bor. Amer. i. 208, Hook. f. Fl. Tasm. ii. 40; *T. montevidense,* Spreng. Syst. ii. 145, Seub. in Mart. Fl. Bras. iii. part i. t. 12.

Queensland. Moreton Island, *M'Gillivray;* Brisbane River, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown, Sieber, n.* 174; Richmond River, *Mrs. Hodgkinson;* Clarence River, *Wilcox.*
Victoria. Mouth of the Glenelg, *Allitt;* Melbourne, *Adamson, F. Mueller;* Mount William, *Sullivan;* Curdie's River; *F. Mueller;* Little River, *Fullagar.*
Tasmania. Salt Marshes, abundant, *J. D. Hooker* and others.
S. Australia. St. Vincent's Gulf, *F. Mueller.*
W. Australia. King George's Sound, *R. Brown;* thence to Swan River, *Drummond, Preiss, n.* 2404.

The larger specimens with 3 prominent staminodia have usually broader leaves than the others.

The species is widely spread over extratropical South America and is also in North America and in New Zealand. The Magellan plant however referred to by Grisebach appears to me to be quite distinct both in the rootstock and in the form of the fruit and is probably the true *T. maritima.*

2. **T. centrocarpa,** *Hook. Ic. Pl. t.* 728.—A dwarf slender plant usually densely tufted. Radical leaves subulate, often all under ½ in. rarely rather above 1 in. long. Scapes usually 1 to 2 in. long, or in luxuriant specimens twice as much, very slender, bearing fruits from below the middle. Flowers minute, in a short dense inconspicuous spike, which soon elongates so as to occupy half the scape. Perianth-segments from broadly ovate-acute to lanceolate and acuminate, ¼ to ½ line long, from scarcely exceeding to twice as long as the anthers, the lower flowers often with only 1 anther-bearing segment and 2 lateral empty ones, the others with 3 or rarely 6 segments, all anther-bearing, but the majority of the numerous specimens seen are in fruit with the perianth and stamens fallen away. Fruit linear, usually about 2 lines, but varying from 1 to 3 lines long, with 3 perfect cells, truncate at the top and obtuse or more or less 3-toothed with the three stigmas, each perfect carpel 3-ribbed on the back, the lateral ribs with either a prominent angle or a tooth or spur at the base, the 3 barren carpels sometimes as thin as in *T. striata*, sometimes as thick as the perfect ones but solid inside, and in some small specimens only one seed ripens in the whole fruit.—Hook. f. Fl. Tasm. ii. 40; Endl. in Pl. Preiss. ii. 54; *T. nanum*, F. Muell. in Trans. Vict. Inst. 1855, 135, and in Hook. Kew. Journ. viii. 332, Fragm. vi. 82.

Victoria. Wendu Vale, *Robertson*, near Melbourne, *Harvey;* Brighton, Hopkins River, Station Peak, etc., *F. Mueller;* Murray River, *Dallachy.*

Tasmania. Abundant in sandy moist places, *J. D. Hooker.*

S. Australia. Barossa Range and Holdfast Bay, *F. Mueller.*

W. Australia. King George's Sound to Swan River, *F. Mueller*, *Drummond*, 1*st. coll. n.* 682 *and n.* 313, *Preiss*, *n.* 2409 and 2411; Murchison and Vasse Rivers, *Oldfield.*

The fruits in this species are exceedingly variable in size and position. In the rare form figured as above they are strictly erect, almost sessile and 2 lines long, in some Tasmanian specimens sessile or distinctly pedicellate on different scapes of the same tuft; in some luxuriant specimens from W. Australia fully 3 lines long, on short or long pedicels; in a large number of specimens from all localities scarcely more than 1 line long, erect or spreading, on pedicels varying from ½ to 3 lines; in another series from W. Australia, Tasmania, and Victoria, distinguished by F. Mueller, Fragm. vi. 82 under the name of *T. minutissima*, the fruits are also scarcely above 1 line long, but almost sessile and very spreading. This however is connected with the commoner form with longer more erect fruits by numerous intermediates. *T. trichophora*, Nees; Endl. in Pl. Preiss. ii. 54, from Rottenest Island, is a small slender form, with almost sessile spreading fruits, the terminal one distant from the others, which however Micheli is of opinion cannot be specifically separated from *T. centrocarpa.* I cannot find in any of the specimens any traces of the pendulous hairs inside the carpels mentioned by Endlicher, for which he may perhaps have mistaken the inner membrane of the pericarp, which when old splits readily almost into hairs.

Var. *calcitrapa.* Fruits fully 3 lines long, the basal spurs 1 to 1½ lines or in one fruit 2 lines long.—*T. calcitrapa*, Hook. Ic. Pl. t. 731.—Swan River, *Drummond*, 1*st coll.* The figure quoted gives rather an exaggerated idea of the spur even of the single specimen drawn.

3. **T. mucronata,** *R. Br. Prod.* 343.—A dwarf tufted plant, usually 1 to 3 in. high, but in some luxuriant specimens the scape twice as long. Leaves linear-filiform, shorter than the scape. Flowers minute, with 1 to 3 or rarely 6 perianth-segments and anthers as in *T. centrocarpa.* Fruits sessile or very shortly pedicellate, sometimes only 2 or 3 on the scape, sometimes rather numerous towards the end, and in a few specimens a single fruit terminates the scape, all broadly obovoid or angular-turbinate, truncate at the top, with the upper outer angles often but not always mucronate by the persistent styles, those of the 3 perfect deciduous carpels horizontal, those of the three dissepiment-like barren persistent ones erect.—Endl. in Pl. Preiss. ii. 54; F. Muell. Fragm. vi. 81; *T. Neesii*, Endl. l. c.

Victoria. Hopkins River, Point Lonsdale, Mount Abrupt, *F. Mueller.*

S. Australia. Rivoli Bay, Port Lincoln, Kangaroo Island, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown*; and thence to Swan River. *F. Mueller*; *Drummond, n.* 177, *Preiss, n.* 2402.

SECTION II. CYCNOGETON.—Fruits with 3 to 6 perfect nutlets, without any barren ones or persistent axis. Stamens usually 6, rarely 4 or 5.

4. **T. procera,** *R. Br. Prod.* 343.—Root-fibres swollen into ovoid or oblong tubers. Leaves from a terete base linear, flat, ¼ to above ½ in. broad, often several feet long when growing in deep water, the upper portion floating on the surface. Scapes 1 to several feet high, the terminal spike from 2 or 3 in. to above 1 foot long. Flowers very numerous, nearly sessile. Perianth-segments 6 or rarely fewer, orbicular and 1½ to 2 lines diameter, or narrower and not longer than the anthers. Carpels 6 or rarely fewer, united to above the middle or sometimes at the base only, tapering into erect or recurved stigmas. Fruits exceedingly variable, from almost orbicular to narrow-oblong, 2 to 3 lines long, straight or spirally twisted, the carpels themselves straight or falcate.—Hook. f. Fl. Tasm. ii. 40; F. Muell. Fragm. vi. 83; *T. linearis*, Endl. in Pl. Preiss. ii. 54; *Cycnogeton Huegelii*, Endl. in Ann. Wien. Mus. ii. 211, Iconogr. t. 73, and in Pl. Preiss. ii. 55; *C. linearis*, Sond. in Linnæa, xxviii. 225.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Rockhampton and neighbourhood, *O'Shanesy*, *Bowman*; Brisbane River, *Bailey.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *J. D. Hooker*, *Woolls*; New England, *C. Stuart*; Macleay River, *C. Moore*; Clarence River, *Wilcox.*

Victoria. Rivers and Creeks from the S. Australian frontier eastward, *Robertson*, *F. Mueller* and many others.

Tasmania. Abundant in fresh and brackish waters, *J. D. Hooker.*

S. Australia. Torrens River, *F. Mueller*; Encounter Bay, *Whittaker.*

W. Australia. Swan River, *Drummond*, *Preiss*, *n.* 2406; Lake Muir, *Mair.*

Var. *eleutherocarpa.* Fruiting carpels free from the base and very much curved,

but usually 6.—W. Australia, *Drummond*, *n.* 314, *Preiss*, *n.* 2105; Blackwood and Tweed Rivers and Port Gregory, *Oldfield.*

Var. *dubia.* Carpels 3, rarely 4 or 5, curved as in the var. *eleutherocarpa* and apparently free from the first, often stipitate when in fruit.—*T. dubium*, R. Br. Prod. 343.—M'Adam Range and Robinson River, *F. Mueller*; Cape River, *Bowman*; Rockingham Bay, *Dallachy.* I find no specimen in Brown's herbarium but refer this to his species from his diagnosis.

The genus *Cynogeton* was founded by Endlicher chiefly on the presence of a second abortive ovule in each carpel. This second ovule is not mentioned by any other observer. and Hooker could not find it. I searched in vain for it in a number of carpels taken from different varieties and it is only in one that I found a minute stipitate appendage to the short funicle which might possibly be an abortive ovule, though quite shapeless.

5. **T. Maundii,** *F. Muell. Fragm.* vi. 83.—Roots apparently thick, with numerous small fibres. Stems erect, terete, leafless, 2 ft. high or more. No leaves seen except a long loose membranous sheath at the base of one of the stems. Spikes not dense, attaining 2 to 4 in. when in fruit, the flowers and fruits all sessile. Stamens 4 to 6, the anther-cells very distinct but adnate to a common connective as in the rest of the genus, the subtending perianth-segments sometimes thin, sometimes very broad and thickened at the apex. Carpels usually 2 or 3, sometimes 4, connate to the truncate apex, the stigmas broad and very spreading. Fruit about 3 lines long, cylindrical, but with 2 furrows on the back of each carpel, the carpels almost drupaceous, each with a thinly cartilaginous endocarp with an acute dorsal rib, the exocarp loose, rather thick, the 2 dorsal obtuse ribs often leaving cell-like cavities between them and the endocarp. Seed slender, cylindrical, erect. —*Maundia triglochinoides*, F. Muell. Fragm. i. 23.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *W. Hill*, *Bailey.*
N. S. Wales. Tweed River, *Guilfoyle.*

It is probably from a clerical error that F. Mueller described the seed as pendulous. I also find 4 to 6 2-celled anthers, not 8 to 12 1-celled ones, the cells being always united in pairs by the connective.

2. POTAMOGETON, Linn.

Flowers hermaphrodite. Perianth-segments 4, scale-like, small, broad, contracted at the base or almost stipitate. Stamens 4, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels 4, distinct; styles short, terminal or the oblique stigmas sessile; ovules solitary in each carpel, laterally attached at or above the middle. Fruit of 4 nutlets or fewer by abortion, somewhat drupaceous, the exocarp membranous or slightly fleshy, the endocarp rather hard, crustaceous. Seed much incurved or horseshoe-shaped, round a clavate or obovoid projection of the endocarp; testa membranous. Embryo the shape of the seed.—Aquatic herbs with a perennial rootstock; stems submerged and floating usually forked and often rooting at the lower nodes. Leaves alternate or rarely opposite, wholly submerged or with a lamina floating on the surface, dilated at the base into membranous sheathing margins or more frequently the margins more or less detached from and united within the petiole into sheathing stipules often very deciduous. Flowers small, sessile in dense spikes or heads on axillary peduncles.

The genus is dispersed in the fresh or subsaline waters of the greater part of the globe. Of the nine Australian species seven are common in most temperate regions especially in the Old World, another extends over East India and the Malayan Archipelago, and one only is endemic but more nearly allied to American than to Old World species.

Kunth considers the flowers as unisexual, describing the stamens as distinct male flowers and the carpels of the ovary as separate female flowers, a view in which it seems very difficult to concur.

SECTION I.—*Leaves all alternate and petiolate with floating laminæ, or the lower ones submerged. Stipules connate within the petiole.*

Fruit-spikes cylindrical. Seed not forming a complete coil.
  Floating leaves usually 2 to 4 in. or longer. Nutlets ovoid, scarcely beaked . . . . 1. *P. natans.*
  Floating leaves ¾ to ½ in. long. Nutlets distinctly beaked . . . . 2. *P. tenuicaulis*
Fruit-heads globular. Nutlets small, not beaked. Seed forming a complete coil . . . . 3. *P. Drummondii.*

SECTION II.—*Leaves all submerged, sessile or nearly so, those under the peduncles and branches opposite, the others alternate. Stipules connate within the petiole, often very deciduous.*

Leaves stem-clasping, ovate or almost orbicular, many-nerved . . . . 4. *P. perfoliatus.*
Leaves oblong-lanceolate, many-nerved . . . . 5. *P. prælongus ?*
Leaves narrow-oblong or rarely linear, usually 3-nerved, very obtuse, the margins often undulate-crisped . . 6. *P. crispus.*
Leaves narrow-linear, obtuse or scarcely acute, 1-nerved. Spikes ½ in. long or more . . . . 7. *P. obtusifolius.*
Leaves narrow-linear, very acute, 1- or 3-nerved. Spikes short and few-flowered. Seed forming almost a complete coil . . . . 8. *P. acutifolius.*

SECTION III.—*Leaves all submerged, sessile or nearly so with sheathing margins but no distinct stipules.*

Leaves narrow-linear, 1-nerved. Stems repeatedly dichotomous . . . . 9. *P. pectinatus.*

1. **P. natans,** *Linn.; Kunth, Enum.* iii. 127.—Upper leaves or often the whole of them on long petioles, floating on the surface of the water, of a thick opaque texture, ovate or oblong, 2 to 4 in. long by 1 to 1½ in. broad, or rarely in small varieties about half that size, usually rounded at the base, but sometimes cordate or tapering, marked by several (5 to 9 or rarely 11) longitudinal nerves with a few cross veins often branched or slightly netted; lower submerged leaves usually few or often wanting, rarely all submerged thin and narrow but always tapering at the base into a stalk and several-nerved. Stipules closely sheathing, connate, free from the petiole except at the very base. Spike

dense and cylindrical, often 1 in. long or more, on a stout peduncle. Nuts ovoid, above 1 line long, slightly compressed, nearly straight, with 1 or 3 dorsal ribs, obtuse or acute, quite entire or more or less denticulate or muricate.—R. Br. Prod. 343; Hook. f. Fl. Tasm. ii. 41; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 50; *P. heterophyllus*, Hook. f. Fl. Tasm. ii. 41, and of some authors, but not the true plant of Schreber.

Queensland. Rockhampton, *O'Shanesy*, *Bowman.*
N. S. Wales. Port Jackson, *R. Brown*; common in rivers and creeks, *Woolls* and many others.
Victoria. Rivers and creeks in various parts of the colony, *F. Mueller* and many others.
Tasmania. Ponds and still rivers, abundant, but usually a small-leaved variety, *J. D. Hooker* and others.
S. Australia. Murray and Tamunda Rivers, *F. Mueller.*
W. Australia, *Drummond*; Murchison River, *Oldfield.*

The species is one of the most common over the greater part of the area of the genus. The few specimens in which the floating leaves are wanting are sometimes confounded with varieties of *P. obtusifolius*, but are readily distinguished by the leaves more or less petiolate and several-nerved.

2. **P. tenuicaulis,** *F. Muell. Fragm.* i. 90, 244, viii. 217.—Perhaps a variety of *P. natans*, with which it is closely connected through the small Tasmanian variety of that species. Stems almost filiform. Floating leaves oblong-elliptical or lanceolate, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, acute at the base, few-nerved. Stipules very thin. Submerged leaves few, linear. Spikes dense, 4 to 6 lines long. Nutlets smaller than in *P. natans*, more distinctly rostrate and the ribs often but not always denticulate.

N. Australia. Gulf of Carpentaria, *F. Mueller.*
Queensland. Brisbane River, *Bailey*; Moreton Bay, *Leichhardt*; Rockhampton, *Bowman*, *O'Shanesy*; Rockingham Bay, *Dallachy*; Mount Elliot, *Fitzalan.*

This is evidently the same as the Bengal plant which Indian botanists have referred to the North American *P. hybridus*, Mich. which it closely resembles in habit, foliage, and inflorescence, but the fruit is very different and the seed is not spirally coiled. It may be, as suggested by F. Mueller, the same as *P. javanicus*, Hassk. from Java, and if so, should bear that name, but the character given is insufficient for verification and we have no specimens for comparison.

3. **P. Drummondii,** *Benth.* — Floating leaves on long slender petioles, elliptical-oblong, 1 to $1\frac{1}{2}$ in. long, thin and many-nerved; submerged leaves rather numerous, exceedingly thin, linear or linear-lanceolate, many in. long, usually 5-nerved, contracted into a petiole. Peduncles slender. Fruiting-spikes or heads ovoid or globular, about 3 lines diameter, with numerous small closely packed nutlets, each one scarcely 1 line long, the dorsal rib and lateral angles very prominent, the style scarcely so. Seed much curved forming usually a complete coil.

W. Australia, *Drummond.*

This differs from most old-world species and comes nearest to the N. American *P. hybridus* in its small nutlets and coiled seeds, but differs from that species in the submerged leaves remarkably large and ulva-like, the floating leaves much thinner and rather longer and the seed not quite so spiral.

4. **P. perfoliatus,** *Linn.; Kunth, Enum.* iii. 133.—Leaves all submerged, alternate except under the peduncles and branches where they are opposite, all sessile, ovate or almost orbicular, clasping the stem with broad rounded auricles which are sometimes united on the opposite side, thin and many-nerved, ¾ to 1½ in. long and often quite as broad. Stipules only on very young shoots. Peduncles longer than the leaves. Spike cylindrical, rarely above 6 to 8 lines long. Nutlets scarcely beaked.—R. Br. Prod. 343; F. Muell. Fragm. viii. 219; Reichb. Ic. Fl. Germ. t. 29.

N. S. Wales. Hunter's Patersons and Williams Rivers, *R. Brown.*
Victoria. Tambo and Lake Wellington, *F. Mueller.*
Tasmania. South Esk River, *C. Stuart.*

Common in the northern hemisphere.

5. **P. prælongus,** *F. Muell. Fragm.* viii. 217, *but perhaps not of Wulf.*—Leaves all submerged, alternate except under the peduncles and branches where they are opposite, mostly stem-clasping, oblong-lanceolate, obtuse, more or less contracted at the base, 2 to 4 in. long, the margins slightly crisped, many-nerved but the midrib broad and very prominent underneath towards the base, the lateral nerves fine and often faint. Stipules short and thin, very soon disappearing. Peduncles mostly shorter than the leaves, the flowering spike dense, 3 to 5 lines long. Fruit not seen.

Victoria. Tambo River, *F. Mueller.*
Tasmania? Specimens from South Esk River, *C. Stuart*, without flowers may possibly be the same species.

I cannot match these specimens with any of the numerous ones we have of *P. prælongus* from various parts of the world. In the typical species the stipules are remarkably conspicuous and persistent besides minor characters.

6. **P. crispus,** *Linn.; Kunth, Enum.* iii. 133.—Leaves all submerged, alternate and contracted at the base, except when under the branches or peduncles where they are opposite and stem-clasping, all linear or narrow-oblong, very obtuse, the margins usually undulate-crisped, 1 to 2 or rarely nearly 3 in. long, with a strong central nerve and a slender one on each side at some distance from it. Stipules only seen on the young shoots. Peduncles rather long. Spikes usually 4 to 5 lines long. Fruits rather large, distinctly beaked, the dorsal rib or ribs entire or rarely denticulate.—R. Br. Prod. 343; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 29.

N. Australia. Albert River, *F. Mueller.*
Queensland. Rockhampton, *O'Shanesy* and others.
N. S. Wales. Williams River, *R. Browne;* Tweed River, *C. Moore;* Darling River, *Mrs. Ford.*

Common in the northern hemisphere. The typical form has the leaves very much broader than in *P. obtusifolius* and much crisped on the edges, but the narrow-leaved forms come very near to that species.

7. **P. obtusifolius,** *Mert. et Koch; Kunth, Enum.* iii. 135.—Stems

slender, terete or somewhat flattened. Leaves all submerged, alternate except under the peduncles or branches where they are opposite, narrow-linear, entire, usually 3-nerved with a very few transverse veins, obtuse or almost acute, sessile and rounded or shortly contracted at the base, mostly 1½ to 3 in. long. Stipules often persistent and at length splitting into threads, but all fallen away from some specimens. Peduncles not long. Spikes usually ½ in. or rather longer, not very dense. Nutlets about 1½ lines long, with a straight or hooked beak, often rugose, the dorsal rib and lateral angles usually obtuse and scarcely distinct but sometimes more prominent and toothed. Seed usually much curved with the upper end obliquely reflexed.—F. Muell. Fragm. viii. 216; Reichb. Ic. Fl. Germ. t. 25; *P. gramineus*, R. Br. Prod. 343; Hook. f. Fl. Tasm. ii. 42 and of some others.

N. S. Wales. Ponds near the Hawkesbury, *R. Brown*; Camden county, *Miss Atkinson;* New England, *C. Stuart.*

Victoria. Yarra and several other rivers, *F. Mueller* and others.

Tasmania. South Esk River, *Gunn, C. Stuart.*

S. Australia. Torrens River, *F. Mueller.*

The Linnean names *P. gramineus* and *P. compressus* have been so variously applied to this and the following species, as well as to the varieties of some of the heterophyllous species with the leaves all submerged, and the species were so vaguely defined by Linnæus himself that they cannot now be satisfactorily identified, and I have followed most modern authors in taking up the species at first correctly defined by German botanists and suppressing entirely the Linnean names.

The *P. obtusifolius* is one of the most generally spread over the area of the genus. Tuckerman defines the N. American form as having the upper curved end of the embryo (and seed) horizontal; I have found it very variable, slightly or much curved, sometimes almost coiled, usually reflexed, but I have never seen it horizontal.

8. **P. acutifolius**, *Link; Kunth, Enum.* iii. 135.—Very near *P. obtusifolius*, with the same habit and stipules, the stems more frequently flattened and the leaves generally very acute, with 1 prominent central nerve and very often 1 on each side, but they are not connected by transverse veins, and the very fine numerous longitudinal veins, scarcely visible in *P. obtusifolius*, are here rather more conspicuous. Spikes short and few-flowered. Nutlets smaller and more curved than in *P. obtusifolius*, and the seed almost forming a complete coil.—Reichb. Ic. Fl. Germ. t. 26; *P. compressus*, F. Muell. Fragm. viii 216, and of many authors.

Victoria. Murray River, *F. Mueller.*

9. **P. pectinatus**, *Linn.; Kunth, Enum.* iii. 137.—Stems very slender, repeatedly dichotomous. Leaves all submerged, very narrow-linear, 2 to 3 in. long, 1-nerved, most of them dilated at the base into a rather long sheath, which is scarious at the edge and often projecting at the top into 2 small scarious lobes, the sheathing stipules of the other species wanting or rarely sheathing the base of the peduncle. Peduncles usually bearing several clusters of 2 or 3 flowers at some distance from each other, forming a slender interrupted spike, rarely reduced to a single terminal cluster. Nutlets of *P. obtusifolius* or rather smaller.—

Reichb. Ic. Fl. Germ. t. 19; *P. marinus*, Linn.; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 18.

Victoria. Yarra and Gillibrand Rivers and Lake Colac, *F. Mueller.*
Tasmania. Derwent River, *Abbott.*
S. Australia. Holdfast Bay, St. Vincent's Gulf, *F. Mueller.*

Very generally distributed over the area of the genus, in fresh and brackish waters.

TRIBE II. ZOSTEREÆ.—Flowers hermaphrodite or unisexual. Perianth none or rudimentary or in one sex only. Carpels 1 to 3 or rarely more, 1-seeded or rarely several-seeded. Aquatic submerged plants, mostly marine or subsaline.

3. RUPPIA, Linn.

Flowers hermaphrodite, in a spike enclosed when young in the sheathing bases of the floral leaves. Perianth none. Anthers 2, each with 2 distinct cells (described sometimes as four 1-celled anthers), the cells opening outwards; pollen-grains narrow-oblong, slightly curved, with the ends somewhat dilated. Carpels 4, at first sessile, but soon protruded on long stalks, each with 1 pendulous ovule and terminating in a short style or almost sessile broad stigma. Fruiting carpels ovoid or pear-shaped, often oblique. obtuse or more or less produced into a slightly curved beak.—Subsaline aquatic plant, with slender much-branched stems and linear-filiform leaves.

The genus is limited to a single species, common in salt and brackish lagoons and marshes in most temperate or subtropical regions of the globe, varying much in the more or less slender foliage, in the beak of the fruit, etc., and divided by some botanists into several species.

1. **R. maritima,** *Linn.; Kunth, Enum.* iii. 123.—Stems and leaves submerged, filiform, the leaves often very long, the barren ones alternate, slightly dilated at the base, the floral ones crowded several together, dilated at the base into thin almost scarious sheaths closely imbricate and completely enclosing the young spike, which soon emerges on a short or long and spirally coiled peduncle bringing it to the surface of the water. Flowers 2 to about 6, sessile, at first close together, at length often distant. Anthers not ½ line long. Carpels at the time of flowering not exceeding the anthers, but immediately afterwards the anthers fall away, and the stalks of the carpels lengthen out to from ½ in. to above 1 in. Ripe carpels about 1 line long or rather more.—Hook. f. Fl. Tasm. ii. 42; F. Muell. Fragm. viii. 217; Nees, Gen. Fl. Germ.; Reichb. Ic. Fl. Germ. t. 17.

Queensland. Moreton Bay, *F. Mueller.*
Victoria. Portland Bay and other points along the coast, also Lake Calvert, where it is eaten by cattle, *F. Mueller.*
Tasmania. Abundant in the Tamar, Derwent, etc., *J. D. Hooker.*
S. Australia. Holdfast Bay, *F. Mueller.*
W. Australia, *Drummond, n.* 180, 182, 183, mixed with *Lepilæna;* Murchison River, *Oldfield.*

4. POSIDONIA, König.

(Caulinia, *DC.*)

Flowers hermaphrodite or the terminal one of each spike male or semi-abortive. Perianth none. Anthers 3, consisting of a broad almost fleshy connective, with 2 short dorsal cells at the base separated by the broad thick centre. Ovary of 1 sessile carpel, with a single erect ovule, terminating in 2, 3 or more short stigmatic lobes. Fruit indehiscent, the pericarp thick and fleshy or succulent. Seed adnate to one side of the cavity; embryo erect, straight, with a rather large plumule in a terminal grove.—Marine submerged plants, the base of the stem covered with the filamentous remains of old leaf-sheaths. Leaves often very long, breaking off transversely from the persistent sheathing base. Scape leafless below the inflorescence, bearing at the end several spikes, each in the axis of a short floral leaf, the peduncle enclosed at the base in 2 sheathing bracts, each flower subtended by a small bract and 2 bracteoles.

Besides the Australian species which appears to be endemic, there is one other limited to the Mediterranean and to the European shores of the Atlantic.

1. **P. australis,** *Hook. f. Fl. Tasm.* ii. 43.—Submerged old stems covered with longer and finer filaments than in *P. oceanica.* Leaves often 2 to 3 ft, long, 2 to 4 lines broad, rounded at the end, with rather numerous fine longitudinal veins. Scapes in the specimens seen about 1½ ft. long. Spikes 3 or 4 at short distances from each other, 2 to near 3 in. long, the lowest one pedunculate in the axil of a floral leaf longer than itself, the others sessile with shorter floral leaves, each with a pair of sheathing bracts at the base ½ to 1 in. long. Flowers 6 to 12 on each spike. Bracts and bracteoles shorter than the anthers, broadly ovate or orbicular, peltately attached and very deciduous except the attached centre which persists. Connectives ovate-lanceolate, tapering to a point (not truncate with a subulate point as in *P. oceanica*), 2½ to 3 lines long, the basal cells on the back about one fourth as long. Carpel contracted at the top, with a thick 2 to 4-lobed stigma. Fruit ovoid-lanceolate, 7 to 8 lines long, but not seen quite ripe.—Aschers. in Linnæa, xxxv. 171; *Caulinia oceanica,* R. Br. Prod. 339, not of DC.

Tasmania, *R. Brown* (not labelled in his herb.); near George Town, below low-water mark, *Gunn.*

S. Australia. St. Vincent's Gulf, *F. Mueller.*

W. Australia. King George's Sound, *F. Mueller,* and probably from the same shore, *R. Brown* (not labelled in his herb.), *Drummond.*

5. ZOSTERA, Linn.

Flowers unisexual, the males and females in alternate rows on the membranous rhachis of a spike enclosed in the sheathing base of the floral leaf. Perianth none. Male flowers of a single sessile oblong laterally attached 1-celled anther; pollen confervoid. Female flowers of a single carpel, laterally attached near the apex and produced above the attachment into a filiform 2-branched style. Ovule 1, pendulous. Fruit an indehiscent pendulous nutlet. Embryo with a deep longitudinal groove, forming 2 valves which fold over the long curved linear cotyledonous end.—Marine submerged plants with a creeping rhizome emitting short stems, with long narrow grass-like leaves separating from their narrow sheathing bases by a transverse line. Peduncles axillary or terminal, bearing a single spike completely enclosed in the slightly dilated but continuous sheathing base of the floral leaf or spatha, which otherwise resembles the stem-leaves. Rhachis of the spike broad and thin, with the margins folded inwards and bearing the flowers and fruits only on the inner surface.

The genus consists of very few species, perhaps reducible to two only, common in most seas at or near the shores. The Australian species have both been described as endemic, but one at least if not both appear to be identical with forms observable in other seas, although the common broader leaved variety of *Z. marina* has not yet turned up from Australian seas.

Floral sheaths ½ to ¾ in. long and scarcely above 1 line broad, the rhachis inside with a little transverse vertical appendage or plate over every carpel . . . . . 1. *Z. nana.*
Floral sheaths nearly 1 in. long and 2 lines broad, the rhachis inside without transverse appendages . . . . 2. *Z. tasmanica.*

1. **Z. nana,** *Roth; Kunth. Enum.* iii. 117.—Rootstock slender. Leaves narrow-linear, rarely above 1 line broad, varying in length from a few inches to 1 or 2 ft., usually truncate or notched at the end, with 1 conspicuous central nerve and 1 or 2 lateral ones on each side often scarcely apparent. Peduncles ½ to 1 in. long, the floral leaf or spatha usually rather narrower than the others, except the sheath which is ½ to ¾ in. long and above a line broad, the margins quite closed over the spike but not connected, the stigmas usually protruding at the time of flowering. Rhachis of the spike thin and membranous, lining the inside of the sheath but free from it, the margins folded inwards and bearing just within the edge on each side 2 or 3 vertical plates folded inwards over some of the flowers.—*Z. marina*, Hook. f. Fl. Tasm. ii. 44, and R. Br. Prod. 338? partly; *Z. Muelleri*, Irmisch; Aschers. in Linnæa, xxxv. 168.

Coasts of **Victoria** and **S. Australia**, *F. Mueller* and of **Tasmania** *Gunn*, *J. D. Hooker.*

The Australian form is distinguished by Ascherson and others from the *Z. nana* of the northern hemisphere, chiefly by the apex of the leaf being truncate with a very open notch in the one, and narrow with a deep narrow notch in the other, but I find differences as great in this respect between different specimens from the same seas, as between those taken from different hemispheres. Every where the species seems to vary in the number and shape of the inflected plates as well as in the foliage, but I always find these plates just within the margin of the rhachis, as drawn in Nees' Genera Fl. Germ., not strictly marginal as they are usually described.

2. **Z. tasmanica,** *G. v. Mart.: Aschers. in Linnæa*, xxxv. 168.—Foliage of the broader leaved specimens of *Z. nana*, or of the narrowest varieties of the northern *Z. marina*, the leaves rather above 1 line broad,

and rounded, not notched nor truncate, at the end. Peduncles short. Sheathing base of the floral leaf or spatha when in fruit about 1 in. long and nearly 2 lines broad, without any of the inflected plates on the rhachis of the spike at least in the single one examined, but the specimen very imperfect. This floral leaf is described as having no lamina but in the portion I have seen of the original specimen although it has generally fallen off there are still the remains of it attached to some of the spikes.—*Z. marina*, R. Br. Prod. 338?

Victoria. Port Phillip and Lady Bay, *F. Mueller*.

Tasmania. R. Brown's and some of Gunn's specimens without fructification probably belong rather to this species than to *Z. nana*. It remains to be shown whether the *Z. tasmanica* be really distinct from the narrow-leaved variety of the common *Z. marina*, Linn.

6. CYMODOCEA, Kœn.

(Amphibolis, *Agardh.*)

Flowers unisexual, solitary within sheathing bracts, but with the bracts sometimes several in a cyme. Perianth none. Male flowers of 2 sessile anthers more or less connate by their backs, with 2 parallel cells opening outwards in longitudinal slits. Female flowers of 2 distinct carpels, each tapering into a filiform style with 2 stigmatic branches or lobes; ovule 1 in each carpel, laterally attached near the top. Fruit-carpels 1-seeded, indehiscent (or at length opening in 2 valves?). Seed ovoid or oblong, testa membranous. Embryo with a short thick radicular base, grooved at the top with a slender incurved cotyledonous end.—Marine submerged plants, with a creeping rhizome rooting at the joints, the leafy stems very short or lengthened and erect. Leaves linear, narrow and long or rather broader and short, with a short sheathing base, in some species enclosed at the base in a long sheathing scale.

The genus extends over the Old World coasts of the Atlantic and Pacific as well as of the Indian and Mediterranean seas, with one West Indian species. Of the four Australian species here mentioned one only is endemic, the others, if correctly identified, have a general range in the Old World, but none of the Australian specimens I have seen show any fructification and of some of the described species the female flowers at least are entirely unknown, there is therefore much uncertainty in the generic and specific characters given, as well as in the indentification of species.

Leaves at or near the ends of rather hard stems closely marked with the annular scars of fallen leaves; no external scales.
  Leaves truncate at the end, with acute angles or teeth . . 1. *C. antarctica.*
  Leaves rounded and ciliate-serrulate at the end . . . . 2. *C. ciliata.*
Leaves narrow on short stems, the nodes or scars rather distant, enclosed at the base in a sheathing scale.
  Leaves 2 to 3 lines broad . . . . 3. *C. serrulata.*
  Leaves 1 to 1½ lines broad . . . . 4. *C. isoetifolia ?.*

1. **C. antarctica,** *Endl. in. Pl. Preiss.* ii. 273.—Rhizome emitting hard stems, more branched and more slender than in *C. ciliata*, but similarly marked with numerous annular scars of fallen leaves. Leaves

1 to 3 in. long, 3 to 4 lines broad, truncate at the end with the two angles more or less produced into short teeth, the smooth sheathing bases with narrow inflexed margins, and separated from the lamina by a transverse line, more or less prominent on the upper or inner surface and sometimes produced into lateral teeth. Fructification imperfectly known, only from Gaudichaud's figure.—Hook. f. Fl. Tasm. ii. 44; *Ruppia antarctica*, Labill. Pl. Nov. Holl. ii. 116. t. 264; Gaudich. in Freyc. Voy. Bot. t. 40. f. 2; *Caulinia antarctica*, R. Br. Prod. 339; *Amphibolis antarctica*, Aschers. in Linnæa, xxxv. 164; *A. zosterifolia*, Agardh; F. Muell. Fragm. iv. 113.

Victoria. Coast near Melbourne, *Adamson.*
Tasmania. Rocks in the sea near George Town, *Gunn.*
W. Australia, *Drummond, n.* 112, 237, 289.

2. **C. ciliata,** *Ehrenb.; Aschers. in Linnæa,* xxxv. 162, and in *Anleit. Wiss. Beob.* 363.—Rhizome emitting hard almost woody stems of 3 or 4 in. to nearly 1 ft., marked with numerous annual scars of fallen leaves and ending in a tuft of broad linear leaves, usually falcate, 3 to 6 in. long and about 4 lines broad, rounded and ciliate-serrulate at the end, contracted at the base into a short brown sheath clasping the stem all round, the margins closing at the base but not united. Fructification unknown.—*C. serrulata,* F. Muell. Fragm. viii. 218, but not of R. Br.

N. Australia. Whitsunday Islands, *Kilner.*
Queensland. Various places along the coast from Northumberland Islands to Cape Upstart, *Fitzalan.*

I have not seen the specimens from Cape York, *Daemel*, which F. Mueller l. c. distinguishes as the true *C. ciliata*, but I can find no difference whatever between Fitzalan's specimens and those from various parts of the coasts of E. India, eastern Africa, and the Red Sea.

3. **C. serrulata,** *Aschers. in Anleit. Wiss. Beob.* 362. — Leafy branches not so hard as in *C. ciliata*, and the leaves or annular scars of fallen leaves distant. Leaves broad-linear, shorter than in *C. ciliata*, varying from 2 to 3 lines long, rounded and minutely denticulate or almost entire at the end, the sheathing base rather longer than in *C. ciliata*. Fructification unknown.—*Caulinia serrulata*, R. Br. Prod. 339.

Queensland? Some specimens without fructification from Port Denison, *Fitzalan*, nearly resemble R. Brown's.
S. Coast? *R. Brown*, the specimens in his herbarium have no label.

4. **C. isoetifolia,** *Aschers. in Linnæa,* xxxv. 163?—Habit of *C. serrulata*, but the leaves much narrower and remarkable when in fructification by the sheathing bracts, rather numerous, in a dichotomous cyme, although each pair encloses only a single flower.

Queensland? Some fragmentary specimens from Edgecombe Bay, *Fitzalan*, may possibly represent this species which is known chiefly from the East Indian coasts.

7. LEPILÆNA, J. Drumm.

(Hexatheca, *Sond.*)

Flowers unisexual, usually diœcious, solitary within a pair of sheathing bracts (sometimes wanting to the central flower of a male cluster). Male flowers: Perianth very small, cupular, 3-toothed or 3-lobed, almost reduced to a slight dilatation of the pedicel. Anthers 3 or rarely 2, sessile, each with 2 cells opening outwards in longitudinal slits and all united by their backs so as to appear like a single oblong 6-celled anther. Female flowers sessile or pedicellate within the bracts. Perianth of 3 segments. Carpels 3, distinct, sessile or shortly stipitate, tapering into a short or long style with an entire oblong stigma; ovule 1 in each carpel. Fruit of 3 oblong nutlets. Seed attached near the apex, oblong-linear. Embryo straight, except the cotyledonous end more or less involute.—Submerged plants, with filiform much-branched stems and capillary leaves often minutely serrulate, dilated at the base into narrow stipular sheaths, the floral leaves nearly opposite, their sheaths more or less dilated, enclosing at least the male flowers.

The genus is exclusively Australian, inhabiting freshwater or saline marshes and lagoons. It has been by some referred to the Mediterranean genus *Althenia*, but that has certainly the single stamen in the same cluster as the female flowers and the peltate stigma of *Zannichellia* from which it is scarcely generically distinct.

Style much shorter than the carpel.
  Female flowers on pedicels soon elongated, the perianth-segments ovate, much shorter than the carpels . . . 1. *L. australis.*
Style filiform longer than the carpel.
  Female flowers pedicellate above the sheath. Perianth-segments inconspicuous, nearly as long as the carpels 2. *L. cylindrocarpa.*
  Female flowers on pedicels shorter than the sheaths. Perianth-segments rather longer than the carpels and very conspicuous . . . . 3. *L. Preissii.*

1. **L. australis,** *J. Drumm.; Harv. in Hook. Kew. Journ.* vii. 58.—Stems filiform, much-branched. Leaves capillary, slightly dilated and sheathing at the base. In the male plant floral leaves several together, their dilated stipular bases forming an involucre of 2 or 3 lines completely enclosing 2 or 3 flowers, each flower also enclosed in 1 or 2 very thin stipular membranous sheaths without any or with very short laminæ. Flowers shortly stipitate, the anthers sessile immediately above the minute cupular perianth. In the female plant floral leaves with narrow stipular bases, the flowers shortly pedicellate, but the pedicels soon elongating to from 3 to 6 lines or even longer. Perianth of 3 ovate segments not ½ line long. Carpels 3, oblong, tapering into a style shorter than the carpel itself with a slightly dilated oblong stigma. Fruits under 1 line long, shortly stipitate on the receptacle.

W. Australia. Swan River or King George's Sound, *Drummond, n.* 100, 179, 184, 397; Hutt River, *Oldfield.*

Tasmania? *Zannichellia palustris*, Hook, f. Fl. Tasm. ii. 43, from Arthur's Lake, *Gunn*, without flowers, and Swanport, *Story*, with male flowers, is referred by

F. Mueller to this species. The specimens are unfortunately not in a state for accurate determination. The young fruits are broader than in *L. australis* and slightly tuberculate, the styles short, but the stigmas already worn off.

2. **L. cylindrocarpa,** *Benth.*—A diœcious plant with the filiform stems and capillary leaves of *L. australis*, but the bases of the leaves scarcely dilated and the stipular sheaths of the floral leaves much narrower than in that species. Male flowers the same. Females pedicellate above the sheathing base from the first, the pedicel sometimes elongating as much as in *L. australis*. Perianth-segments narrow and thin, not exceeding the carpels and not very conspicuous. Carpels about 1 line long, rather more slender than in *L. australis*, the filiform style as long as the carpel, with an oblong stigma. *Zannichellia cylindrocarpa*, Körnicke in Walp. Ann. vi. 3; *Hexatheca australis*; Sond. MS.; included in *Lepilæna Preissii* by F. Muell. Fragm. viii. 217.

Victoria. Saline waters at the mouth of the Yarra and near Station Peak. *F. Mueller.*

Tasmania. Near Hobarton, *Gunn.*

S. Australa. Saline Marshes, Port Adelaide, *F. Mueller.*

3. **L. Preissii,** *F. Muell. Fragm.* viii. 217, *partly.*—Stems and leaves usually still finer than in the two preceding species, the sheathing bases very narrow. Male flowers much the same. Females usually numerous along the stem, the 2 floral leaves at their base with narrow sheaths often scarious at least at the end and the filiform laminæ short. Flowers shortly pedicellate within the sheath, the pedicel rarely slightly exceeding it when in fruit. Perianth-segments rather longer than the carpels, narrow but usually striate and whitish or more or less scarious so as to be much more conspicuous than in *L. cylindrocarpa*. Fruit-carpels cylindrical, almost sessile, about 1 line long. Style filiform, longer than the carpel, with an oblong clavate stigma.—*Zannichellia Preissii*, Lehm. in Pl. Preiss. ii. 3.

Victoria. Lake Wellington and Lake Calvert, *F. Mueller.*

W. Australia, *Drummond, n.* 115, 181; Canning River, *Preiss, n.* 1879; north of Stirling Range, *F. Mueller.*

8. NAIAS, Linn.

(Caulinia, *Willd.*)

Flowers unisexual, solitary in the axils of floral leaves, sessile or shortly pedicellate. Male flower: anther single, 1- or 4-celled, enclosed in a thin membranous bract or perianth, irregularly lobed at the top and often splitting and rolling back so as to disclose the apex of the anther; pollen globular. Female flowers sessile. Perianth none besides the bract. Carpel 1, tapering into a style divided into 2, 3 or sometimes 4 stigmatic branches; ovule 1, erect. Fruit a small indehiscent oblong or cylindrical nutlet. Seed erect, with a hard testa; embryo straight, with a prominent plumula.—Submerged fresh-

water or subsaline herbs, with slender branching stems. Leaves linear, in pairs or clusters so as to appear opposite or verticillate, bordered by minute or prominent acute or pungent teeth, dilated at the base into a membranous sheath often produced on each side into hyaline toothed or ciliate stipular lobes.

The genus is widely spread over the temperate and some of the warmer regions of the globe. Of the two Australian species one may be endemic, the other occupies the general area of the genus.

P. Magnus, in an elaborate memoir on the anatomy of the genus (Beiträge zur Kenntniss der Gattung Naias, Berlin, 1870, with 8 plates) describes the ovary as a perianth with stigmatic lobes, and the ovule consequently as naked, and the epidermis of the anther as an inner perianth, views in which it is exceedingly difficult to concur.

Leaves prominently toothed almost pinnatifid, the basal sheath not produced into scarious stipules . . . . . 1. *N. major.*

Leaves very narrow, the teeth very minute, the basal sheath produced on each side into a broadly lanceolate stipular lobe . . . . 2. *N. tenuifolia.*

1. **N. major,** *All.; Kunth, Enum.* iii. 112.—Leaves linear, bordered by broad triangular acute very prominent teeth so as to be almost pinnatifid, $\frac{1}{2}$ to nearly 1 in. long, dilated at the base into a very short broad toothed sheath not different in texture from the lamina nor produced into stipular lobes, "aculeate on the back as well as the stem" but the prickles few or so minute as to be difficult to see on the dried specimens. Flowers diœcious. Male perianth oblong, consisting of a thin membranous sac entirely enclosing the anthers, 2- or 3-toothed and at length bursting irregularly at the top. Anther sessile, 4-celled. Female flower a single oblong carpel with 2 or 3 linear stigmatic lobes, the ripe nutlet about $1\frac{1}{2}$ lines long.—F. Muell. Fragm. viii. 218; Nees Gen. Fl. Germ. Ic.

N. Australia. Flinders River, *F. Mueller.*
W. Australia. Murchison River, *Oldfield.*

The species is widely spread over the northern hemisphere.

2. **N. tenuifolia,** *R. Br. Prod.* 345.—Stems slender, much branched. Leaves very narrow linear, flat and transparent, mostly about 1 in. long, 1-nerved, bordered by rather numerous very minute teeth often only visible under a strong lens, the sheathing base very short but produced on each side into a rather long broadly lanceolate ciliate-toothed stipular lobe. Male flower stipitate, oblong, about $\frac{1}{2}$ line long. Female carpel about 1 line long, oblong-cylindrical, produced into a filiform deeply 2-branched style as long as the carpel.—F. Muell. Fragm. viii. 219.

Queensland, *R. Brown?* Brisbane River, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown;* Hunter's River, *Leichhardt;* Nepean River, *Woolls.*
Victoria. Murray River, *F. Mueller.*

I have not seen Brown's specimens and give his stations from his Prodromus.

The species is reduced by A. Braun in Seem. Journ. Bot. 1864, 278, to a variety of *N. graminea*, Del. (from N. Africa, E. India, and the Malayan Archipelago), relying chiefly on the form of the stipular lobes of the leaf-sheaths. If the two species are really identical it is Brown's name that should be adopted as being by far the older one. Magnus, however, Nuov. Giorn. Bot. Ital. ii. 189, describes the anther of *N. graminea* as 4-locular, and according to Brown that of *N. tenuifolia* is 1-locular. I have only been able to find a single male flower in the Australian specimens before me, and that was too much pressed for examination ; it remains to be ascertained whether the difference is real, or is only a different mode of describing the same anther.

9. HALOPHILA, Thou.

Flowers unisexual, solitary within a pair of herbaceous bracts. Male flower : Perianth of 3 segments. Anthers 3, sessile, alternating with the segments, erect, 2-celled, the cells opening outwards ; pollen confervoid. Female flowers : Perianth none. Ovary single, tapering into a filiform style with a short stigma either entire or divided into 3 to 5 filiform segments. Ovules several, erect, attached to the sides of the cavity. Fruit membranous, opening irregularly. Seeds nearly globular, with a thin testa, rather loose. Embryo erect with a thick radicular base nearly the shape of the seed, with a distinct plumula and an involute or spiral cotyledonous end both nearly immersed in a terminal groove.—Submerged marine herbs. Leaves in pairs apparently opposite, sessile or petiolate, the petioles frequently enclosed at the base in 2 broad scarious white or hyaline scales. Floral bracts axillary, sessile or the males pedicellate.

The genus is confined to the Indian and West Pacific Oceans and Mediterannean sea. Of the two Australian species one is widely dispersed over the shores of the Indian and Pacific Oceans, the other, as far as is known, is endemic.

Leaves on long petioles with an ovate or oblong entire lamina 1. *H. ovalis.*
Leaves sessile or nearly so, broadly linear, rounded and ciliate-toothed at the end . . . . 2. *H. spinulosa.*

1. **H. ovalis,** *Hook. f. Fl. Tasm.* ii. 45.—Stems creeping and rooting under water, emitting at each node 2 broad thin colourless hyaline scales 2 or 3 lines diameter and within them a pair of leaves with long slender petioles and a herbaceous lamina varying from oval and under $\frac{1}{2}$ in. long to oblong-elliptical and 2 to $2\frac{1}{2}$ in. long, very thin, penniveined with a broad central nerve and very fine oblique lateral veins, the margin quite entire. Involucres or double spathas enclosing the flowers ovate, sessile within the scales. Male flowers on pedicels emerging from the involucre, females sessile within it.—Aschers. in Nuov. Giorn. Bot. Ital. iii. 301 ; *Caulinia ovalis*, R. Br. Prod. 339 ; *Halophila ovata*, Gaudich. in Freyc. Voy. Bot. t. 40, f. 1 ; F. Muell. Fragm. viii. 219 ; *Diplanthera*, Griff. Ic. Pl. Asiat. t. 161, C. f. 2, and other synonyms quoted by Aschers. in Linnæa, xxxv. 173.

Queensland, Brisbane River, Moreton Bay, *F. Mueller ;* Port Denison, *Fitzalan ;* Cape York, *Moseley.*

N. S. Wales. Paramatta River, *Woolls ;* Lord Howe's Island, *Lind and Fullagar.*

Victoria. Port Phillip and Queenscliffe, *F. Mueller.*
Tasmania. Bass's Straits, *Gunn.*
S. Australia. M'Donnell's Bay, *Mrs. Wehl;* St. Vincent's Gulf, *F. Mueller.*

The species is common on the shores of the Indian and Pacific Oceans, often above low-water mark at the mouths of large rivers, or brought up from depths of seven fathoms or more. All the Australian specimens I have seen are without fructification.

2. **H. spinulosa,** *Benth.*—Stems slender, submerged, with simple branches of 3 to 6 in. in the specimens seen. Leaves opposite, distichous sessile, broadly linear or almost spathulate, rounded at the end and bordered by small acute teeth or cilia, $\frac{1}{2}$ to $\frac{3}{4}$ in. long and about 2 to $2\frac{1}{2}$ lines broad, 3-nerved, without any scales or sheathing stipules at the base, but the margin on the lower side dilated into a semi-oval appendage folded over the lamina. Male flowers unknown. Females within a pair of small herbaceous bracts sessile in the axils, in fruit in the only specimen seen, the capsules solitary, ovate, about 2 or $2\frac{1}{2}$ lines long, apparently bursting irregularly. Seeds several, rather more than $\frac{1}{4}$ line diameter, closely resembling those figured by Gaudichaud of *H. ovalis.* Embryo almost globular, the plumula and the narrow cotyledonous end curved over it, both enclosed in a cavity at the top of the embryo.—*Caulinia spinulosa,* R. Br. Prod. 339.

Queensland. Port Denison, *Kilner;* coral reefs, Albany Island, *F. Mueller;* tropical Australia, *R. Brown;* Cape York, *Moseley.*

The specimens in Brown's herbarium have no label indicating their station. They have no fructification, but Kilner's specimen in F. Mueller's herbarium in fruit is in other respects precisely similar. The species is certainly very different from *H. stipulacea* to which Ascherson (Linnæa, xxxv. 172) thought it might belong from Brown's short diagnosis. F. Mueller, Fragm. viii. 219, proposes it as a new genus under the name of *Aschersonia*, but that name is preoccupied in Fungi, and the fruit and seeds of our plant agree so well with those of *Halophila*, that it does not seem worth while to separate it generically on account of the foliage which is far from uniform in what are admitted as true species of *Halophila.*

ORDER CXXXIX. ALISMACEÆ.

Flowers hermaphrodite or unisexual, regular. Perianth when perfect of 6 segments, imbricate in 2 series, the 3 outer ones membranous or herbaceous, the 3 inner larger and petal-like, often very fugacious, and in some genera only 2 segments present, 1 on each side. Stamens 6, 9 or indefinite, hypogynous or slightly connected with the base of the segments, but when isomerous with them not usually opposite their centres; filaments filiform or flattened; anthers erect, with 2 parallel cells opening laterally in longitudinal slits. Ovary of 3, 6 or many carpels, quite distinct or shortly connate, each tapering into a short style or with a sessile terminal stigma; ovules 1, 2 or few, erect from the base of the cavity, or the funicle of the inner one shortly adnate to the inner angle, or numerous and parietal. In fruit the carpels ripen into indehiscent nutlets, or when several-seeded are variously dehiscent. Seeds erect or when several ascending or spreading, with a thin testa and inner membrane; no albumen. Embryo either straight and of the shape of the seed, or more frequently horse-shoe shaped; radicle inferior.—Marsh or water plants. Leaves radical on long petioles. Flowering stems leafless, or rarely, in species not Australian, leafy. Flowers in terminal umbels racemes panicles or simple or once forked spikes.

The Order is represented in the marshes, ponds, and shallow waters of most parts of the globe. Of the four Australian genera, two are cosmopolitan, the two others extend over tropical Asia and Africa, one of them also in South Africa.

Perianth perfect. Flowers pedicellate, paniculate, umbellate or almost racemose.
  Carpels 1-seeded, indehiscent, scarcely beaked . . . . 1. ALISMA.
  Carpels 2-seeded, tapering into divaricate beaks falling off by a transverse rupture near the base . . . . 2. DAMASONIUM.
  Carpels many-seeded, dehiscent along the inner suture . . 3. BUTOMOPSIS.
Perianth reduced to 2 petal-like or very small segments.
  Flowers sessile in a simple or once forked spike . . . . 4. APONOGETON.

There is also in Herb. F. Mueller a single flower with one leaf of a plant gathered by Hartmann in South Queensland, which appears to be a species of *Hydrocleis* or *Limnocharis*, with the inner perianth 3 in. diameter, closely resembling that of *L.* (*or H.*) *Humboldtii*, Rich., a South American plant. The peduncle is enclosed in longer bracts than usual in that plant and the outer perianth segments are longer and narrower, but the specimen is insufficient to show whether it is really distinct, and it may be only accidentally introduced from South America.

1. ALISMA, Linn.

Flowers usually hermaphrodite. Perianth of 6 segments, 3 outer ones membranous or almost herbaceous, 3 inner large and petal-like. Stamens 6. Ovules solitary in each carpel. Fruit-carpels indehiscent, either about 6 or numerous, arranged in a ring round the depressed axis, or (in species not Australian separated by some into a distinct genus) irregularly crowded in a globular head. Seed ovate or oblong, with a horse-shoe embryo.—Aquatic herbs, erect or in species not Australian floating, with radical leaves on long petioles. Flowers either in a terminal umbel with or without whorls of pedicellate flowers below it, or in a panicle with whorled branches, each bearing a similar umbel.

The genus is widely spread over the temperate and warm regions of the globe. Of the four Australian species one is cosmopolitan, two others are common to tropical Asia, the fourth is endemic. They have all four tall leafless loosely paniculate flowering stems, and the long petioles of the radical leaves often appear jointed from transverse partitions of thickened pith, but this character does not appear to be constant in any one species.

Carpels 15 to 30, in a flat ring. Transverse veinlets of the leaf very oblique . . . . 1. *A. plantago.*
Carpels 6 or fewer, rarely 7 or 8.
  Leaves deeply cordate with a narrow sinus, the outer primary veins on each side confluent in the auricles, transverse veinlets not very close and more or less connected by reticulations.

Carpels about 3 lines long, hard, often muricate . . . 2. *A. acanthocarpum.*
Carpels under 2 lines long, smooth or tuberculate, the pericarp not very hard . . . . 3. *A. oligococcum.*
Leaves broadly cordate or reniform, the primary veins all distinct, transverse veinlets very numerous and closely parallel. Carpels somewhat drupaceous . 4. *A. reniforme.*

1. **A. plantago,** *Linn.; Kunth, Enum.* iii. 148.—Rootstock perennial, sometimes very hard and almost bulbous with the thickened sheathing bases of the petioles. Leaves ovate oblong or elliptical, shortly acuminate, 3 to 4 in. long in well-grown specimens, usually 7-nerved, the transverse veinlets very oblique, not close and more or less connected by reticulations. Flowering stem 1 to 4 ft. high, with a large loose panicle often above 1 ft. long, with whorled divaricate branches and pedicels. Outer perianth-segments ovate, striate, persistent, about 1 line long; inner ones twice as large, of a pale pink, very fugacious. Carpels 15 to 30, obovate, laterally flattened, 1 to 1¼ lines long, bearing the remains of the style on the inner edge below the apex, and marked on the back with an impressed or slightly prominent dorsal nerve, the whole forming a flat ring of 2½ to 3 lines diameter with a depressed centre.—R. Br. Prod. 342; Red. Lil. t. 452; Nees, Gen. Fl. Germ.; Reichb. Ic. Fl. Germ. t. 57.

N. S. Wales. Port Jackson, *R. Brown, Woolls.*
Victoria. Goulburn River, *F. Mueller.*

The species is generally spread over the area of the genus, especially in the northern hemisphere.

2. **A. acanthocarpum,** *F. Muell. Fragm.* i. 23, viii. 214.—Leaves broadly ovate or orbicular, deeply cordate with a narrow sinus and angular auricles, glandular-dotted, with 11 to 17 primary nerves, the outer ones on each side confluent within the margin of the auricles, the transverse veinlets not very close and often connected by reticulations. Panicle not so loose and broader than in *A. plantago*, usually 6 to 9 in. long and broad, the branches and pedicels 3 or 4 in each whorl, the bracts under the whorls more herbaceous than in any other species, the lowest often above 1 in. long and shortly connate at the base. Flowers of *A. plantago.* Fruit-carpels usually 6 or fewer but sometimes 7 or 8, the largest of the genus, being about 3 lines long when ripe, the pericarp hard and rather thick, with 3 or 4 dorsal ribs more or less muricate, 2 or more of the prickles often conical and very prominent.

N. Australia. Lower Victoria River, *F. Mueller;* Gulf of Carpentaria, *Gulliver.*
Queensland. Rockingham Bay, *Dallachy;* Mount Elliott, *Fitzalan.*

3. **A. oligococcum,** *F. Muell. Fragm.* i. 23, viii. 214.—Closely allied to *A. acanthocarpum.* Leaves the same, with the same narrow basal sinus glandular dots and almost pedate venation. Flowers also similar, in a broad panicle with the lower bracts leafy, but smaller or

more slender than in that species. Carpels usually only 2 or 3 perfect 1½ or rarely 2 lines long, very obtuse, the 3 or 4 prominent dorsal ribs smooth or tuberculate but not muricate.—*A. glandulosum*, Thw. Enum. Pl. Zeyl. 332.

N. Australia. Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*.
Queensland. Moreton Bay, *Hill and F. Mueller*; Herbert's Creek and Gainsford, *Bowman*; Rockingham Bay, *Dallachy*.

Also in Ceylon and East India. This and the preceding species may prove to be varieties of a single one. The *A. oligococcum* varies much in stature, some of the Rockingham Bay specimens are not 6 in. high, with small leaves. The larger specimens have loose panicles of about 1 ft. and rather large leaves, sometimes very thin.

4. **A. reniforme,** *Don, Prod. Fl. Nep.* 22.—Leaves orbicular-cordate or reniform, 1½ to 4 in. long and often broader than long, very obtuse, with 13 to 17, usually 15 primary nerves, the transverse veinlets very numerous fine and closely parallel. Panicle very large, with long verticillate branches not numerous in each whorl. Outer perianth-segments nearly orbicular, many-nerved, about 2 lines long. Carpels 6 or fewer, rarely 7 or 8, thick and more or less drupaceous, with several usually 7 or 9 dorsal ribs not tuberculate, the style rather slender, adnate to the inner edge to near the summit.—Wight, Ic. t. 322.

Queensland. Burnett River, *F. Mueller*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

The species is also common in many parts of East India. F. Mueller. Fragm. viii. 214, refers this to the European *A parnassifolium*, Linn. and Micheli, who has been studying the order with great care, thinks it may be a variety only, but the broad almost retuse shape of the leaf, its numerous primary nerves and the generally large habit, together with the great geographical separation, may justify the retaining it as a distinct species.

2. DAMASONIUM, Juss.

(Actinocarpus, *R. Br.*)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones membranous, 3 inner larger and petal-like and very fugacious. Stamens 6. Ovules 2 in each carpel. Fruit carpels 6 to 9 or rarely more, laterally flattened, adnate by their broad base to the convex or conical receptacle, tapering into a beak, spreading, when ripe usually breaking off transversely near the base. Seeds 2 or solitary by abortion. Embryo horse-shoe shaped.—Aquatic or marsh herbs, with the habit of the annual *Alismas*.

Besides the Australian species which is endemic, the genus comprises two others from the northern hemisphere, all three closely allied to each other and possibly varieties of one.

1. **D. australe,** *Salisb.*; *Kunth, Enum.* iii. 155.—A tufted glabrous annual. Leaves all radical, on long petioles, from ovate-cordate to lanceolate, 1 to 2 in. long, with 3 or 5 primary nerves connected by several rather distant transverse veins, and these again by numerous

cross parallel veinlets. Stems leafless, 6 in. to 1 ft. high, flowering from about the middle, with verticillate branches either all 1-flowered and ½ to 1 in. long, or some of them elongated bearing an umbel of 5 to 10 flowers. Outer perianth-segments scarcely above ½ line long; inner ones rather larger but exceedingly fugacious. Carpels usually about 9, but varying from 5 to 10, breaking off when ripe by a transverse somewhat curved line, usually dropping the lower seed and carrying off the upper one with it. Seeds oblong, tuberculate.—F. Muell. Fragm. viii. 215; *Actinocarpus minor*, R. Br. Prod. 343; *Alisma minus*, Spreng. Syst. ii. 163.

Queensland. Herbert's Creek, *Bowman*; Armidale, *Parrott*; North Queensland, *Armit*.
N. S. Wales. Cow-pastures, Port Jackson, *R. Brown*.
Victoria. Yarra, Murray, and Avoca Rivers, *F. Mueller*.
W. Australia, *Drummond*, *n*. 99.

3. BUTOMOPSIS, Kunth.

(Tænagocharis, *Hochst.*)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones thinly membranous, reticulate, 3 inner rather larger, petal-like but very thin and transparent, fugacious. Stamens 8 or 9. Ovules numerous in each carpel. Fruit-carpels 6 or sometimes 7, slightly cohering at the base, and adnate to the flat receptacle, tapering into short spreading beaks, opening along the ventral suture. Seeds very numerous. Embryo horse-shoe shaped.—Semi-aquatic or marsh plant, with radical leaves on long petioles. Flowers on long pedicels, in a simple terminal umbel.

The genus is limited to a single species spread over tropical Asia and Africa. It has the polyspermous carpels of *Butomus*, with the embryo of *Alisma*. Kunth's and Hochstetter's names appear to have been published contemporaneously. I have preferred the former not only as having been published in a general work but as being accompanied by a much more accurate character with a reference to known species overlooked by Hochstetter. The whole genus is however perhaps not sufficiently distinct from the American *Limnocharis*.

1. **B. lanceolata,** *Kunth, Enum.* iii. 165.—Leaves oblong-lanceolate or elliptical, acute or obtuse, usually attaining the length of the scape including their long petiole. Scape 4 to 8 in. high under the umbel, which consists of from 3 to above 20 pedicels 1½ to 4 in. long when in fruit, surrounded by a few thin scarious bracts. Outer perianth-segments ovate or nearly orbicular, 2 to 2½ lines diameter when in flower, persistent and sometimes rather larger under the fruit; inner segments rather larger and very deciduous. Ripe carpels shortly exceeding the perianth. Seeds smooth and shining, scarcely more than ¼ line long.—*Butomus lanceolatus*. Roxb. Fl. Ind. ii. 315; Royle, Illustr. Him. Bot. t. 95; *Tænagocharis cordofana*, Hochst. in. Flora, 1841, 369; F. Muell. Fragm. x. 104.

N. Australia. Lagoons on Gilbert River, *Armit*.

4. APONOGETON, Thunb.

Flowers hermaphrodite. Perianth of 2 segments one on each side. small or in species not Australian petal-like. Stamens usually 6. Carpels of the ovary usually 3, with 2 to 6 ovules in each carpel all erect from the base. Seeds ovoid or oblong, erect. Embryo straight, with a more or less prominent plumula in a groove on the inner face. – Aquatic herbs with erect or floating or submerged leaves usually oblong or narrow. Scapes leafless except a very deciduous membranous bract or spatha enclosing the young spike, but almost always fallen away before the flowering, leaving an annular scar. Flowers sessile in a terminal spike, simple in the Australian species but divided into two in some African and Asiatic ones.

The genus extends over tropical Asia and tropical and southern Africa. Of the two Australian species one is a common Indian one, the other appears to be endemic. The specific characters derived from the bulb-shaped rhizome may not be constant, having been observed only in a very few dried specimens to which the roots remain attached.

Bulb-shaped rootstock covered with filamentous remains of leaf-sheaths and emitting roots from the base. Leaves under 6 in. long. Fruit-carpels tapering into a short recurved style . . . . 1. *A. monostachyus.*
Bulb-shaped rootstock without filaments, emitting fibrous roots from the apex. Leaves above 6 in. long. Fruit-carpels obtuse with the rudimentary style almost lateral . . . . 2. *A. elongatus.*

1. **A. monostachyus,** *Linn. f. Suppl.* 214.—Rootstock thickened into a hard woody bulb-shaped tuber, covered with filamentous remains of old leaf-sheaths and emitting fibrous roots from the base or lower half. Leaves mostly submerged, oblong or lanceolate, obtuse or almost acuminate, cordate or rounded at the base, mostly 3 to 4 in. long and $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, with 5, 7 or rarely only 3 longitudinal nerves. Spikes simple, usually dense, 2 to 2$\frac{1}{2}$ in. long, rarely longer more slender and interrupted. Spatha 2 or 3 lines long, falling off before the first flower expands. Perianth-segments from broadly lanceolate to obovate, membranous, about $\frac{3}{4}$ line long. Stamens shortly exceeding the perianth. Fruiting carpels ovoid, tapering into a short recurved beak. Seeds 2 to 6, erect, narrow-oblong, the outer membrane loose and almost hyaline, the inner more opaque darker coloured and closely appressed to the embryo.—Thunb. Nov. Gen. Pl. 73, with a figure; Roxb. Corom. Pl. t. 81; Andr. Bot. Rep. t. 406; *Spathium monostachyum*, Edgew. in Calcutta Journ. iii. 533, t. 16, corrected to *Aponogeton monostachyus* in Hook. Lond. Journ. iii. 401, t. 17.

N. Australia. Gilbert River, *Gulliver*.

Queensland. Rockhampton, *Thozet*, *O'Shanesy*; Burdekin River, Herbert's Creek and Gainsford, *Bowman*. The species is widely spread over tropical Asia.

2. **A. elongatus,** *F. Muell. in Herb. Hook.*—Tuberous rootstock formed below the uppermost fibrous roots and without the filamentous

covering of *A. monostachyus* (at least in the specimens seen). Leaves submerged, very tender, from 6 in. to above 1 ft. long, and ½ to 1½ in. broad, contracted at the base or very rarely produced on one or both sides into a short basal auricle, with 5, 7 or 9 longitudinal nerves. Spikes simple as in *A. monostachyus* but more slender and the flowers not so close. Perianth and stamens as in that species. Carpels of the ovary very short with scarcely prominent styles and in fruit they are ovoid-globular, 2 to 3 lines long, very obtuse, with the very short remains of the style almost lateral. Seeds usually 3 or 4 in each carpel, narrow oblong, the outer membrane not striate, the inner one exceedingly delicate. Embryo with a narrow groove, the small plumula at the base of the groove below the middle of the embryo.

N. Australia. Roper and Van Alphen Rivers, *F. Mueller.*
Queensland. Brisbane River, *F. Mueller ; Bailey.*
N. S. Wales. Richmond River, *Fawcett* ; Clarence River, *Wilcox* (the latter without fructification and the leaves all reduced to long petioles, but probably a state of the same species).

This species is referred by F. Mueller, Fragm. viii. 216, to *A. crispus*, Thunb. or *A. undulatus*, Roxb., which however has the carpels shortly rostrate except when deformed by insects, and ripens only one or rarely two seeds in each carpel, and these seeds are of an ovoid shape with a broad open groove to the embryo.

ORDER CXL. ERIOCAULEÆ.

Flowers unisexual, in androgynous or rarely diœcious heads, with imbricate scarious dry or rarely herbaceous bracts, 1 under each flower, and usually a few outer ones empty. Perianth normally of 6 or 4 hyaline or scarious small segments in 2 rows, the inner ones immediately under the stamens or ovary, the outer ones lower down on the stipes or receptacle, but occasionally reduced in numbers, or those of one row more or less united, especially in the males. Stamens as many as the inner segments of the perianth and opposite to them or twice that number; filaments short; anthers small, 2-celled, the cells opening in longitudinal slits. Ovary of 3 or 2 lobes and cells, with 1 pendulous ovule in each cell; style single, with 3 or 2 filiform stigmatic branches. Capsules slightly enlarged from the ovary and of the same shape, the lobes opening dorsally in 2 valves. Seeds solitary in each cell, globular or ovoid, usually striate or minutely tuberculate. Albumen mealy. Embryo small, obovoid or lenticular, remote from the hilum.—Herbs mostly marsh or aquatic, either tufted with radical leaves or the stems more or less elongated and covered with old leaves, the upper ones forming a terminal tuft. Leaves linear or filiform, rarely lanceolate. Scapes radical or peduncles terminal or in the upper axils, simple and leafless, but each one usually enclosed at the base in a sheathing scale, and bearing a single terminal head. Flowers very small, usually numerous in the head, the outer rows mostly female, the inner ones chiefly male, but the two sexes often variously intermixed, all concealed within the imbricate bracts, the tips of the stigmatic branches and sometimes the anthers slightly protruding, the receptacle often hairy.

The Order is limited in the Old World to the single genus *Eriocaulon*, but there are a few other genera, and one a very large one exclusively American and chiefly tropical.

1. ERIOCAULON, Linn.

Male flowers: Inner perianth at the apex of a slightly thickened stalk, of 3 or 2 teeth or short distinct hyaline segments often fringed or ciliate and usually bearing on their inner face a small dark gland, the segments occasionally very minute or obsolete; outer perianth affixed lower down on the stalk, of 2 or 3 segments either distinct or variously united. Stamens 6 or 4, of which 3 or 2 opposite the inner segments and as many alternating with them or occasionally fewer by abortion. Rudiments of the ovary either 3 glands in the centre of the flower or rarely deficient. Female flower: inner perianth at the apex of a slender stalk (sometimes very short or scarcely any) of 3 or 2 hyaline segments usually erect and sometimes with a small gland on the inner face; outer of 2 or 3 variously shaped segments affixed lower down on the stalk, or sometimes one or both perianth deficient. Ovary 3- or 2-lobed; style branches 3 or 2, without the alternate appendages of *Pæpalanthus*.—Annuals or perennials with the leaves in radical tufts or rarely crowded on an elongated stem. Scapes or peduncles usually longer than the leaves.

The genus extends over the general area of the Order, but chiefly in the Old World, where it is the only one of the Order. Of the nineteen Australian species, four extend into tropical Asia, the remaining fifteen, as far as hitherto ascertained, appear to be endemic, some of them however require further study from more perfect specimens.

SERIES I.—*Flowers 3-merous or rarely partially 2-merous by abortion, especially the females.*

Submerged stems elongated, densely covered with filiform leaves. Flower-heads pubescent, at least at first . . . . 1. *E. setaceum.*

Scapes and radical leaves above 1 ft. long, loosely hairy towards the base. Flower-heads pubescent. Outer perianth-segments winged . . . . 2. *E. australe.*

Scapes and radical leaves under 6 in. and often much less, glabrous.

- Flower-heads pubescent. Bracts with their tips incurved and appressed. Outer perianth-segments not winged.
  - Flowering bracts spathulate, acuminate, the exposed part white with the dorsal pubescence . 3. *E. quinquangulare.*
  - Flowering bracts broad, very obtuse, fringed only with very short hairs . . . . 4. *E. Smithii.*
- Flower-heads glabrous. Bracts with their tips incurved and appressed.
  - Outer ♀ per. segments, linear, 3 or fewer or none.
    - Outer ♂ per. segments united in a spatha-like scale.

Outer ♀ per. segments linear, dilated, inner narrow erect . . . . 5. *E. nanum.*
Outer ♀ per. segments very narrow, inner none 6. *E. cinereum.*
Outer ♂ per. segments linear or oblong-spathulate, free or nearly so.
Outer and inner ♀ per. segments linear.
Plant not ½ in. high, with small leaves . . . 7. *E. pusillum.*
Plant of 1–1½ in., with rather broad linear leaves . . . . 8. *E. pallidum.*
Outer ♀ per. segments linear, inner none . . . 9. *E. nigricans.*
No ♀ per. segments, outer or inner . . . . . 10. *E. australasicum.*
Outer ♀ per. segments 2, complicate and winged.
Inner ♀ per. segments 3, oblong. Ovary 3-merous . . . . 11. *E. lividum.*
Inner ♀ per. segments 2, linear-oblong. Ovary 2-merous . . . . 12. *E. concretum.*
Flower-heads glabrous. Bracts with spreading tips.
Bracts pale-coloured, obtuse or obtusely acuminate. ♀ perianth-segments 6, nearly similar . . . . 13. *E. Schultzii.*
Bracts dark-coloured, cuneate with a rigid spreading point. Receptacle villous . . . . 14. *E. tortuosum.*

SERIES II.—*Flowers all 2-merous.*

Outer ♀ perianth-segments linear or spathulate, very deciduous, not winged.
Scapes filiform, 2 to 4 in. high. Leaves very narrow, fine pointed. Heads 1 to 1½ lines diameter . . 15. *E. monoscapum.*
Scapes 4 to 6 in. high. Leaves broadly linear, many-nerved. Heads near 3 lines diameter . . . . 16. *E. spectabile.*
Outer ♀ perianth-segments complicated with a broad dorsal wing.
Heads at length globular, with the outer bracts reflexed and empty. All the ♀ flowers with outer perianths.
Leaves mostly less than half as long as the scapes. Outer ♂ perianth-segments broadly linear . 17. *E. scariosum.*
Leaves more than half as long as the scape. Outer ♂ perianth segments very narrow . . . . . 18. *E. fistulosum.*
Heads broad. Outer bracts rigid, all flowering. Inner ♀ flowers without outer perianths.
Scapes 2 to 4 in. high. Heads pale-coloured . . 19. *E. depressum.*
Scapes 1 to 2 in. high. Heads nearly black . . . 20. *E. deustum.*

1. **E. setaceum,** *Linn.; Kunth, Enum.* iii. 550.—An aquatic plant with submerged floating stems lengthening out to 1 ft. or more, covered with linear-filiform almost capillary leaves of 1 to 2 in. Peduncles or scapes from amongst the upper leaves 2 to 3 in. long, or in very luxuriant specimens twice as long. Flower-heads depressed or at length nearly globular, rarely attaining more than 2 lines diameter and usually smaller, white with the mealy pubescence of the bracts, becoming dark coloured as it wears off. Bracts broad, the outer empty ones in 1 or 2 rows. Male flowers: 3 outer segments obovate-oblong, slightly fringed at the apex, connate into a lateral scale or at length separate; 3 inner short, usually fringed, with a small gland. Stamens 6. Female flowers: 3 outer segments at the base of the stipes nearly

equal, obovate-spathulate, concave, slightly fringed; 3 inner under the ovary linear, erect. Ovary 3-merous.

N. Australia. Near M'Adam Range, *F. Mueller*; Port Darwin, *Schultz*, *n.* 75, 369.

The species is common in E. India and the Malayan Archipelago. The Australian specimens all belong to the species as restricted by Kœrnicke, Linnæa, xxvii. 603, with the bracts and perianth-segments white-pubescent at the apex. The *E. intermedium*, Kœrn. l. c. 601, with glabrous black heads, reunited by Thwaites with the *E. setaceum*, has not yet been observed in Australia.

2. **E. australe,** *R. Br. Prod.* 254.—The largest of the Australian species, with the habit of the E. Indian *E. Wallichianum*, but differing in the more depressed flower-heads and in the structure of the parts. Scapes and leaves usually 1 to 1½ feet high, sprinkled below the middle with long loose hair, the leaves grass-like, flat or concave, varying in breadth from 1 to 3 lines. Flower-heads depressed-globular or at length nearly as long as broad, attaining 3 to 4 lines diameter, white with the mealy indumentum of the bracts which rarely wear off in the old heads. Bracts closely imbricate, broadly obovate-orbicular, a few outer empty ones glabrous and shorter than the others. Flowers in some heads mostly males, in others the females more numerous. Outer perianth-segments in both sexes complicate, more or less connate, especially in the males, the dorsal keel broadly winged; third segment very narrow in the males, oblong-lanceolate and concave in the females. Inner segments linear and slightly fringed, short in the males, longer in the females. Stamens 6. Ovary 3-merous.

Queensland. Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*.
N. S. Wales. Port Jackson, *R. Brown*; Richmond River, *C. Moore*, *Fawcett*.

3. **E. quinquangulare,** *Linn.*; *Kunth, Enum.* iii. 556.—Scapes rather slender, usually about 6 in. but varying taller or shorter. Leaves rather broadly linear, less tapering at the end than in most broad-leaved species, 1 to 2 in. long. Flower-heads at first slightly depressed, but soon globular and at length rather elongated, 2½ to 3 lines diameter, white with the short white hairs of the bracts which conceal their darker colour. Outer empty bracts short, ovate, scarious, soon reflexed and almost concealed by the flowering ones, which are more or less spathulate and shortly acuminate. Male flowers: 3 outer perianth-segments equal, spathulate, hairy at the tips like the bracts; 3 inner segments very small and fringed. Stamens 6. Female flowers: 3 outer segments linear-spathulate, dark, hairy at the tips, incurved and nearly equal; 3 inner narrow-linear, erect, fringed, with a small gland as in the males. Ovary 3-merous.—Kœrn. in Linnæa, xxvii. 641.

W. Australia. Keckwick's Springs, Arnhem's Land, *Herb. F. Mueller* (collector not named). A single specimen agreeing very well with several from East India where this species is widely spread.

4. **E. Smithii,** *R. Br. Prod.* 254.—Very closely allied to *E. quinquangulare*, differing chiefly in the pubescence of the flower-heads.

Scapes slender, 3 to 5 in. long. Leaves linear or linear-lanceolate, usually about 1 in. long. Flower-heads soon globose; outer bracts ovate, glabrous, at first very conspicuous but almost concealed under the old heads; flowering bracts thin, obovate, scarcely acuminate, glabrous on the back but the broad margins ciliate with short hairs. Male flower: outer perianth-segments 3, oblong-linear, contracted at the base and more or less connate at first, slightly hairy at the tips; inner segments small, fringed. Stamens 6. Female flower: outer segments dark-coloured, oblong-spathulate, concave, incurved, one of them often deficient; inner segments erect, linear-oblong, fringed and hairy at the end with a small gland as in the males. Ovary 3-merous.

Queensland. Moreton Bay, *F. Mueller*; Cape River, *Bowman*; Springsure, *Wuth.*

N. S Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and many others; Hastings River, *Beckler*.

Victoria. Upper Murray River, *F. Mueller*.

5. **E. nanum,** *R. Br. Prod.* 251.—Scapes in the specimens seen $\frac{1}{2}$ to $\frac{3}{4}$ in. high and the leaves mostly under $\frac{1}{2}$ in., linear but not very fine. Flower-heads 1 to $1\frac{1}{4}$ lines diameter, glabrous. Bracts scarious, oblong or ovate-oblong, the outer empty ones obtuse and pale-coloured, the flowering ones rather more acute and darker. Male flower: outer perianth-segments united in a broad dark spatha-like scale open on one side and shortly 3-toothed; inner segments scarcely prominent. Stamens 6. Female flower: 2 or 3 outer segments linear or lanceolate and concave, dark, dilated in the middle; 3 inner narrow-linear, but unequal, erect, denticulate, with a small gland. Ovary 3-merous.

Queensland. Facing Island, Shoalwater Bay, *R. Brown*; Brisbane River, *Bailey.*

6. **E. cinereum,** *R. Br. Prod.* 251.—Scapes filiform, attaining in the larger specimens 3 to 5 in. but sometimes not above 1 to $1\frac{1}{2}$ in. Leaves radical, linear-filiform, from under $\frac{1}{2}$ in. to nearly 2 in. Flower-heads hemispherical, about 1 line diameter when first out, but attaining $1\frac{1}{2}$ lines when in fruit. Bracts thinly scarious, glabrous, a few outer empty ones obovate or oblong and obtuse, the flowering ones broadly lanceolate, acute or acuminate with appressed tips, contracted at the base. Male flower: Outer perianth united in an orbicular concave unilateral 3-toothed or 3-lobed scale, sometimes darker-coloured than the rest of the head and enclosing the rest of the flower; inner segments small, lanceolate, fringed, with small glands. Stamens usually 3, rarely 4 or 5; anthers pale-coloured. Female flower: Stipes rather long, with 3 linear almost capillary segments a little below the ovary, the inner segments deficient. Ovary 2- or 3-celled.—*E. heteranthum*, Benth. Fl. Hongk. 382; *E. ciliiflorum*, F. Muell. Fragm. i. 95.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; South Goulburn Island, *A. Cunningham*; Victoria River, *F. Mueller*; Port Darwin, *Schultz, n.* 368.

The species extends to South China, and will probably be found in various parts of the Malayan Archipelago and perhaps in East India. It is nearly allied to the common *E. sexangulare*, but may be readily distinguished by the male flowers with fringed inner perianth-segments and usually only 3 stamens.

7. **E. pusillum,** *R. Br. Prod.* 254.—The smallest of the known species of the genus, the scapes scarcely ½ in. high, the loose sheathing scales more than half as long. Leaves unknown. Flower-heads scarcely 1 line diameter. Bracts scarious, glabrous or very slightly ciliate at the end, a few outer ones empty, the flowering ones with appressed tips. Male flower: Outer perianth-segments 2, narrow, free; inner segments very small or one only longer and fringed. Stamens 3, rarely 4 or 5; anthers dark-coloured. Female flower: Outer segments 2 or 3, linear, at the base of the stipes; inner segments 3, linear, erect and appressed to the ovary, slightly fringed. Ovary 3-celled.

Queensland. Endeavour River, *Banks and Solander.*

8. **E. pallidum,** *R. Br. Prod* 254.—Leaves in the few specimens seen broadly linear, 1 to 1½ in. long, tapering to a fine point. Scapes about as long. Flower-heads all very young except one which is nearly globular, something like those of *E. liridum*, but smaller, the bracts all obtuse, scarious, glabrous and rather shining. Male flower: Outer perianth-segments 2, linear; inner segments minute or obsolete. Stamens 3. Female flower: Outer segments 2, linear, inner 3, narrow, erect, ciliate. Ovary 3-merous,

Queensland. Endeavour River, *Banks and Solander.* I have not been able to examine the flowers satisfactorily.

9. **E. nigricans,** *R. Br. Prod.* 254.—Scapes filiform, 1 to 2 or rarely 3 in. long. Leaves shorter, sometimes very short, narrow-linear, tapering to a long fine point. Flower-heads globular or somewhat depressed, 1½ or nearly 2 lines diameter. Bracts scarious, shining and silvery white at the inflexed tips, sometimes dark in the lower part, a few outer empty ones obtuse, the flowering ones ovate-lanceolate, obtuse or almost acute. Male flower: Outer perianth-segments 3, linear, slightly dilated in the middle, all free; inner segments very small and glabrous or scarcely prominent Stamens 6 Female flower: Outer perianth-segments 1, 2, or 3, linear, at the base of the stipes; inner segments none. Ovary 3-merous.—*E. achiton*, Kœrn. in Linnæa, xxvii. 630.

N. Australia? Carron Creek, Carpentaria, *Gulliver*, the identification doubtful.
Queensland. Endeavour River, *Banks and Solander;* various localities in the neighbourhood of Rockhampton, *Bowman, O'Shanesy;* Dry-beef Creek, *Leichhardt.*

In the Banksian specimens the leaves are very few and shorter than the sheathing scales, but that appears to be owing to the plants being rather old and the larger leaves withered away. The species is probably not unfrequent in East India, closely resembling the smaller forms of *E. sexangulare*, but differing in the outer perianth-segments of the male flowers linear and entirely free.

10. **E. australasicum,** *Kœrn. in Linnæa,* xxvii. 616.—A slender annual nearly allied to the preceding species and to *E. sexangulare.* Scapes 1 to 3 in. high. Leaves shorter, linear or linear-lanceolate, tapering into a long fine point. Flower-heads globular, under 2 lines diameter, glabrous. Bracts ovate-lanceolate, acute or acuminate, often dark-coloured, a few outer ones rather broader more obtuse and empty. Male flower: Outer perianth-segments 2 or 3, very narrow and thin, inner segments very small and glabrous but showing the small glands. Stamens 6. Female flower: No perianth-segments inner or outer. Ovary on a short slender stipes, 3-merous.—*Electrosperma australasicum,* F. Muell. in Trans. Phil. Soc. Vict. i. 24.

Victoria. Murray River, *F. Mueller.*

11. **E. lividum,** *F. Muell. Fragm.* i. 92.—A dwarf plant but not so slender as the preceding species. Scapes 1 to $1\frac{1}{2}$ in. long. Leaves mostly as long, linear, many-nerved, not very narrow. Flower-heads globular, dense, glabrous but not shining, 3 lines diameter or at length rather more. Bracts of a pale straw-colour, the outer empty ones ovate, obtuse, soon reflexed and at length almost concealed; flowering bracts obovate oblong or cuneate, rather acute, with inflexed tips. Male flower: Outer perianth-segments 3, oblong-spathulate, concave, connate often to above the middle into an unilateral 3-lobed scale; inner segments 3, spathulate, deeply fringed, with a small gland. Stamens 6. Female flower: Outer segments 3, oblong-spathulate, very concave almost complicate, with a rather narrow dorsal wing; inner segments 3, oblong, often slightly jagged at the end, with a small gland, abruptly contracted at the base into a short claw. Ovary 3-merous, the stipes short.

N. Australia. York Sound, *A. Cunningham;* near M'Adam Range, *F. Mueller.*

12? **E. concretum,** *F. Muell. Fragm.* i. 92.—Leaves in the only specimen seen under 1 in. long, several-nerved, linear, tapering to a fine point. Scape slender, 2 in. long. Flower-head globular, $1\frac{1}{2}$ lines diameter, resembling those of *E. lividum* but the bracts more pointed. Male flower: Outer perianth-segments 3, united in an obovate concave spatha-like scale enclosing the rest of the flower; inner segments small, unequal. Stamens "6 or fewer." Female flower: Outer segments 2, concave, complicate, with a broad thick dorsal wing; inner segments 2, erect, linear-oblong, appressed but not concrete with the ovary. Ovary 2-merous.

N. Australia. Arnhem's land, *F. Mueller,* from a single imperfect specimen in his herbarium.

13. **E. Schultzii,** *Benth.*—Scapes slender, 3 to 4 in. high. Leaves very narrow-linear, mostly about 1 in long. Flower-head globular, white but glabrous. Bracts scarious almost hyaline, lanceolate, entire, spreading as in the East Indian *E. stellulata,* but much smaller, the whole head not exceeding 3 lines diameter. Male flower: Outer

perianth-segments 3 at the base of the stipes, equal, oblong-spathulate, concave, nearly as long as the bract; inner segments 3, small, ovate, fringed, with a gland. Stamens 6; anthers dark. Female flower: Segments 6, oblong-linear, all inserted very near to each other near the base of the short stipes, the 3 inner rather longer than the others, slightly jagged at the end, with a small gland; in some of the inner flowers the perianth much reduced. Ovary 2-merous or rarely 3-merous.

N. Australia. Port Darwin, *Schultz, n.* 288.

14. **E. tortuosum**, *F. Muell. Fragm.* i. 91.—Scapes rather slender, 4 to 8 in. long, much twisted. Leaves under 1 in. long, linear-lanceolate, many-nerved, tapering to a point. Flower-heads scarcely above 2 lines diameter; receptacle hairy; outer empty bracts few, oblong-lanceolate; flowering bracts spreading, cuneate-oblong or spathulate, slightly ciliate, rounded at the end with the midrib produced into a long rigid point. Male flower: Outer perianth-segments 3, nearly equal, linear, slightly dilated in the middle; inner segments very small and glabrous. Stamens 6. Female flower: Perianth-segments 6 according to F. Mueller, but in the only flower I could examine I only found 3, about the middle of the stipes, linear-oblong, contracted at the base. Ovary 3-merous.

N. Australia. Victoria river, *F. Mueller.* The specimens are in a very unsatisfactory state having lost almost all their flowers, but I cannot match them with any known species.

15. **E. monoscapum**, *F. Muell. Fragm.* i. 94.—A small slender species. Scapes filiform, 2 to 4 in. high. Leaves very narrow, fine-pointed, 1 to 1½ in. long. Flower-heads of a shining white, glabrous, scarcely 1½ lines diameter when fully out. Outer empty bracts few, scarious, obtuse; flowering bracts appressed. Male flower: Outer perianth-segments 2, linear, slightly dilated in the middle, ciliate at the end; inner segments 2, very small, bearded and with a gland. Stamens 4. Female flower: Outer perianth-segments 2, linear-spathulate, incurved, acuminate, slightly hairy, rigid and very deciduous as in *E. spectabile;* inner segments 2, linear, erect, very narrow. Ovary 2-merous.

N. Australia. Margins of water-courses towards M'Adam range, *F. Mueller.*

16. **E. spectabile**, *F. Muell. Fragm.* i. 95.—Scapes striate, 3 to 6 in. high. Leaves more than half as long, broadly linear, tapering to a fine point. Flower-heads from a pale straw-colour to silvery-white, at first depressed but soon globular, about 3 lines diameter. Outer empty bracts obovate or almost orbicular, obtuse, almost herbaceous; flowering bracts ovate or the inner ones lanceolate, scarious and white but glabrous. Male flower: Outer perianth-segments 2, narrow, about halfway up the stipes; inner segments minute or obsolete. Stamens 4. Female flower: Outer segments 2, linear-spathulate,

falcate, concave but not winged, rather rigid, attached below the middle of the stipes but very deciduous; inner segments erect, hyaline, very narrow linear. Ovary 2-merous.

N. Australia. Sources of the Limmen Bight river, Gulf of Carpentaria, *F. Mueller.*

17. **E. scariosum**, *R. Br. Prod.* 255.—Scapes slender, striate, 3 to 5 in. long. Leaves thick at the base, tapering to a fine point, about 1 in. long. Flower-heads of a light brown colour, soon becoming globular, not above 2 lines diameter. Bracts orbicular, all scarious and glabrous, a few outer ones very obtuse and empty, the flowering ones shortly mucronate, the receptacle villous with long hairs. Male flower: Outer perianth-segments 2, linear, slightly-enlarged upwards, often slightly fringed at the end; inner segments reduced to two small teeth. Stamens 4. Female flower: Outer segments 2, falcate, concave or complicate with a broad dorsal wing; inner segments 2, erect, oval-oblong or obovate, denticulate at the end, shortly contracted at the base into a claw. Ovary 2-merous.

N. Australia. North coast? *R. Brown* (no label in his herbarium); Port Darwin, *Schultz, n.* 261.

18. **E. fistulosum**, *R. Br. Prod.* 255.—Evidently very near *E. scariosum* and most probably a variety only, with longer leaves, attaining more than half the scape, and the outer perianth-segments in the male flowers very narrow. I can find no other difference.

Queensland. Endeavour River, *Banks and Solander.*

19. **E. depressum**, *R. Br. Prod.* 255.—Scapes rigid, striate, 2 to 4 in. long. Leaves as in *E. scariosum* rather thick at the base, tapering to a fine point, short in many specimens (the longer ones having withered away?), but in other specimens more than half as long as the scape. Flower-heads pale-coloured, depressed-globular or hemispherical, nearly 3 lines diameter when fully out. Bracts all orbicular, a few outer ones more rigid and very obtuse, the others thinner and mucronulate, but all flowering. Male flower: Outer perianth-segments wanting; inner segments reduced to 2 small teeth. Stamens 4. Female flower: Outer segments in the flowers of the outer rows 2, falcate, concave or complicate with a broad dorsal wing, more or less connate, deficient in the inner rows of flowers; inner segments erect, obovate or oblong. Ovary 2-merous.—*E. heterogynum*, F. Muell. Fragm. i. 93.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; near M'Adam Range, Fitzmaurice River, *F. Mueller.*

20. **E. deustum**, *R. Br. Prod.* 255.—Very near *E. depressum* and perhaps a variety, differing only in its small stature and the very dark, almost black colour of its scapes and flower-heads. Scapes 1 to 2 in. high, scarcely exceeding the leaves. Flower-heads and flowers of the size and structure of those of *E. depressum*, the outer obtuse rather

rigid bracts rather more numerous, but all floriferous as in that species, and the inner female flowers similarly without outer perianth.

Queensland. Endeavour River, *Banks and Solander.* This is the species to which Banks and Solander originally gave the MS. name of *E. depressum*, which Brown transferred to the preceding species.

ORDER CXLI. CENTROLEPIDEÆ.

Flowers hermaphrodite or polygamous, sessile and solitary or several together within more or less herbaceous bracts, with or without 1, 2 or rarely 3 hyaline scales to each flower. Perianth none. Stamens 1, filament filiform, anther oblong or linear, 1-celled, versatile, opening in a longitudinal slit. Ovary 1, with 1, 2 or 3 collateral cells or 2 or more cells or carpels superposed in 2 rows, with 1 pendulous ovule in each cell or carpel; styles as many as cells or carpels, free or more or less united, terminating in linear stigmas. Fruits of the shape of the ovary, the pericarp membranous, the cells or carpels opening externally in longitudinal slits. Seeds 1 in each cell or carpel or fewer by abortion, pendulous and often laterally adnate to the pericarp; testa thin; albumen somewhat mealy. Embryo small, obovoid or conical, at the end of the albumen furthest from the hilum. —Small tufted plants, mostly annuals, with linear or filiform radical leaves and slender or very short scapes, or, in a genus not Australian, small densely tufted perennials with imbricate leaves. Flowers very small, in solitary terminal heads or spikes, rarely reduced to a single flower.

Besides the three Australian genera which are endemic, the Order includes one other, somewhat different in habit and inflorescence, ranging over New Zealand and Antarctic America. The whole Order has been worked up with great care by Georg Hieronymus in an elaborate memoir extracted from the twelfth vol. of the Abhandlungen der Naturforschenden Gesellschaft of Halle. I think however that the inflorescence divides it into more natural genera than the technical characters adopted by Hieronymus, and I cannot agree with him in considering the inflorescence within the bracts as a one-branched centrifugal cyme, called by him a *cicinnus*. The axis of this inflorescence is so exceedingly short that it is very difficult to follow out its evolution accurately, but where it is a little more developed, as in *Centrolepis Banksii* and *C. exserta*, and in the lowest bract of *Aphelia Drummondii*, it appears to me to be clearly a centripetal secund spike.

Flowers in a depressed head, surrounded by several (about 6) spreading bracts. Ovaries 1-celled with 2 or 3 styles, intermixed with stamens (1 to each ovary?) . . 1. TRITHURIA.
Flowers in a flat spike, with several distichous bracts, the lowest 1 or 2 with 2 or more flowers entirely or partly males, the others with 1 hermaphrodite or female flower. Ovary 1-celled, with 1 style . . . . . . 2. APHELIA.
Flowers within 2 alternate bracts, 1 or more in each bract, usually hermaphrodite. Ovary with 3 or more lobes and cells superposed in 2 rows very rarely reduced to 1 or 2, with 1 style to each lobe or carpel . 3. CENTROLEPIS.

1. TRITHURIA, Hook. f.

Flowers very numerous, in a terminal head, sessile within a few imbricate spreading bracts, probably hermaphrodite, with 1 stamen and 1 ovary each, but the stamens and ovaries so closely packed as to appear irregularly mixed. No perianth or inner scales. Stamens with a filiform filament and oblong anther. Ovaries 3-angled or flattened, with 1 perfect cell and 1 pendulous ovule; styles 3 or 2, filiform, free or shortly connate. Fruit 2- or 3-angled, opening between the angles in valves from the base upwards detached from the filiform angles.—Dwarf tufted annuals, with filiform radical leaves, and slender scapes bearing a single terminal head of minute flowers.

The genus is limited to southern Australia, and seems in some measure to connect *Centrolepideæ* with *Eriocauleæ*. The inflorescence is rather that of the latter, but the total absence of perianth or inner scales would place it rather with *Centrolepideæ*.

Bracts lanceolate, obtuse or scarcely acuminate. Fruits and seeds ovoid . . . . 1. *T. submersa.*
Bracts linear-lanceolate, acuminate. Fruits and seeds narrow-oblong . . . . 2. *T. occidentalis.*

1. **T. submersa**, *Hook. f. Fl. Tasm.* ii. 79. *t.* 138.—Leaves radical, linear-filiform, $\frac{3}{4}$ to 1 in. long. Scapes slender, sometimes very short, sometimes as long as or rather longer than the leaves. Bracts of the head 5 or 6 or sometimes 1 or 2 more, lanceolate, spreading, glabrous, about one line long, thin and pale with a darker central nerve, obtuse rather acute or scarcely acuminate, the outer ones empty, the inner ones close outside the flowers. Stamens with the anthers nearly as long as the bracts; ovaries much shorter though shortly stipitate, the styles not very long. Fruits mostly 3-angled, but some flattened with the edges thickened, very little more than $\frac{1}{4}$ line long.—*Juncella tasmanica,* F. Muell. Second Gen. Rep. 16 (name only).

Victoria. Mount Emu Creek, Axe and Hopkins Rivers, *F. Mueller.*
Tasmania. Bottom of a Lagoon near Macquarie Harbour, *Gunn;* South Esk River, *C. Stuart.*

2. **T. occidentalis**, *Benth.* Very near the longer-scaped specimens of *T. submersa,* but more slender. Scapes filiform, about 1 in. long. Leaves shorter and capillary. Head of the same size, but the bracts linear-lanceolate or almost linear and acuminate. Flowers still more numerous and smaller, the ovaries and carpels narrower. Seed linear-oblong, about $\frac{1}{2}$ line long.

W. Australia, *Drummond, n.* 689.

2. APHELIA, R. Br.

(Brizula, *Hieron.*)

Flowers unisexual or polygamous, sessile and solitary within distichous bracts, or 2 or more together usually males within the lowest

1 or 2 bracts, each flower within one or two hyaline scarious scales, sometimes minute or wanting to the upper flowers. Stamen 1, filament filiform; anther linear or oblong. Ovary of a single 1-ovulate carpel, tapering into a single style with a linear stigma. Fruit slightly enlarged from the ovary, the membranous pericarp opening in a longitudinal slit.—Small tufted plants. Leaves radical, linear-filiform. Scapes slender, with a terminal flat ovate or lanceolate spike, the bracts complicate and distichously spreading, closely or loosely imbricate.

The genus is limited to Australia.

Bracts narrow, loosely imbricate, flowers mostly hermaphrodite except in the lowest bract . . . . 1. *A. cyperoides.*
Bracts rather broad, closely imbricate, flowers female and solitary in the upper bracts, 1 or more male in 1 or 2 lowest bracts.
  Spike nodding, lanceolate. Bracts all alike, the 2 outer with 2 or 3 male flowers in each. . . . . 2. *A. nutans.*
  Spike ovate, turned to one side, the outermost bract more erect than the others.
    Outermost bract narrow with 1, rarely 2 male flowers, the others hirsute without any or very minute inner scales . . . . 3. *A. gracilis.*
    Outermost bract broad with 6 or more male flowers, the others with a cristate keel, and an inner scale to the flower. . . . . 4. *A. Drummondii.*
  Spike ovate, erect, the lowest 2 bracts nearly equal, each with 1 or 2 male flowers. Inner scales of the female flower broad.
    Plant of ½ to ¾ in. Upper bracts appressed, hairy, with the margins dilated and rounded at the base. South Eastern species . . . . 5. *A. pumilio.*
    Plant of 1 in. or more. Upper bracts with a winged or ciliate keel, otherwise glabrous. Western species . . . . 6. *A. brizula.*

1. **A. cyperoides**, *R. Br. Prod.* 252.—Scapes 1 to 3 in. high. Leaves shorter, sheathing at the base with scarious margins sometimes slightly ciliate. Spike ovate, rather loose, the bracts narrow, acuminate, not keeled, the margins scarious and ciliate at the base, mostly about 2 lines long, the lowest 1 or 2 longer and each containing 1 or usually 2 flowers, 1 at least male only. Flowers in the other bracts (6 to 10), solitary and hermaphrodite, each flower with a hyaline lanceolate scale under the stamen, or rarely in the upper bracts the stamen and scale appear to be deficient.—Desv. in Ann. Sc. Nat. ser. 1, xiii. t. 2; Nees in Pl. Preiss. ii. 71; F. Muell. Fragm. v. 204; Hieron. Centrol. 94.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Preiss*, *n.* 1748, *Oldfield*, *F. Mueller* and others.

Hieronymus proposes to limit the genus to this species as having all the flowers solitary and hermaphrodite. I have however in all the specimens I have examined found 2 flowers in the lowest and sometimes also in the next bract, and one of them or sometimes both male only without any ovary.

2. **A. nutans,** *Hook. f. in Herb. Kew.*—Scapes 1 to 2 in. high. Leaves short. Spike nodding, lanceolate, 3 to 4 lines long and

scarcely 1½ lines broad. Bracts lanceolate, obtuse or scarcely acute, ciliate on the margins but not keeled and glabrous on the back, the 2 lower ones scarcely different from the others, each with 2 or 3 male flowers of 1 stamen each with a narrow scale; the other bracts (12 or more) with 1 female flower each, with a very small scale.

W. Australia, *Drummond, suppl. n.* 84.

3. **A. gracilis**, *Sond. in Linnæa*, xxviii. 227.—Scapes ½ to 1 in. high. Leaves as long. Spike ovate, about 2 lines long, the lowest bract narrow, acuminate, rather erect, throwing the spike to one side, glabrous or slightly ciliate, enclosing 1 or rarely 2 male flowers, each with a long scale under the stamen; the other bracts 5 to 9, ovate, thinly scarious, more or less hirsute, enclosing each a single ovary, without any scale or the scale very minute and reduced to a mere notch on the receptacle.—F. Muell. Fragm. v. 204; *Brizula gracilis*, Hieron. Centrol. 92; *A. Gunnii*, Hook. f. Fl. Tasm. ii. 75, t. 138.

Victoria. Darebin Creek, *F. Mueller*; Skipton, *Whan*; near Mount William, *Sullivan.*

Tasmania. Formosa, *Gunn*; South Esk River, *F. Mueller.*

S. Australia. Onkaparinga, *F. Mueller.*

4. **A. Drummondii**, *Benth.*—Scapes 1½ to 3 in. high. Leaves shorter and very fine. Spike broad, oblique or almost nodding, glabrous. Lowest bract broad, obtuse or scarcely acute, with scarious margins, about 2 lines long, not crested, enclosing 6 or more sometimes numerous male flowers, each with a scale under the stamen; the second bract nearly similar but smaller with fewer flowers; the other bracts 8 or more though the whole spike scarcely exceeds the outer bract, all ovate but narrower than in *A. pumilio*, the dorsal keel scariously crested or denticulate, each enclosing a single ovary in a rather broad scale.—*Brizula Drummondii*, Hieron. Centrol. 92.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 933; Tone and Vasse Rivers, *Oldfield.*

5. **A. pumilio**, *F. Muell. in Linnæa*, xxviii. 226, *Fragm.* v. 204.—Scapes ½ to ¾ in. high and leaves not longer. Spike erect, broadly ovate, 2 to near 3 lines long; 1 or 2 outer bracts narrow with narrow scarious margins, acuminate, containing usually 2 male flowers, each of a single stamen enclosed at the base in an oblong scale; upper bracts 10 to 16, complicate, scarious, with short appressed hairs, the margins much dilated and rounded at the base, each containing one ovary enclosed in a broad complicate scarious scale.—Hook. f. Fl. Tasm. ii. 76; *Brizula pumilio*, Hieron. Centrol. 93.

Victoria. Lower Yarra and neighbourhood, *F. Mueller* and many others; Portland, *Allitt*; Wendu Vale, *Robertson.*

Tasmania. Cheshunt, *Archer* (I have not seen this specimen).

S. Australia. Mount Gambier, Rivoli Bay, *F. Mueller.*

6. **A. brizula,** *F. Muell. Fragm.* v. 203. Very near *A. pumilio*, but larger. Scapes usually 1 in. high and sometimes nearly twice as much. Spike erect, broadly ovate, 3 to 4 lines long and broad. Bracts rather broad, scarcely acuminate, the lowest 1 or 2 glabrous including each 2 or 3 male flowers like those of *A. pumilio*, the upper bracts slightly ciliate on the margin, the keel acute and ciliate or the cilia more or less connected in a dorsal wing, each enclosing an ovary with a scale not so broad as in *A. pumilio*.—*Brizula Muelleri*, Hieron. Centrol. 93.

W. Australia, *Drummond, n.* 934 *and suppl. n.* 44 *and* 119; Stirling Range, *F. Mueller.*

3. CENTROLEPIS, Labill.

(Desvauxia *and* Alepyrum, *R. Br.*)

Flowers hermaphrodite, several together or rarely solitary, sessile within 2 sheathing bracts, each one within 1, 2 or 3 hyaline scarious scales rarely entirely deficient. Stamen 1, filament filiform; anther oblong-linear, dorsally attached. Ovary of 3 or more carpels (rarely reduced to 2 or 1) laterally adnate and superposed in 2 rows to one side of a linear receptacle, each with 1 pendulous ovule; styles 1 to each carpel, all distinct or more or less united at the base, all undivided and ending in a linear-filiform stigma. Fruiting carpels slightly enlarged from the ovary and of the same shape; pericarp membranous, opening outwards in a longitudinal slit. Seed of the shape of the carpel and often laterally adnate to the pericarp; testa appressed; embryo small, obovoid or almost lenticular, in a mealy albumen, distant from the hilum.—Small tufted plants mostly annuals. Leaves linear-filiform, all radical. Scapes simple, terminating in the 2 bracts either close together or one a little distant from the other, both flowering or the lower one empty.

The genus is limited to Australia with the exception of one species, closely allied to an Australian one, recently found by Hance in South China.

Spikes narrow, containing 1 to 4 flowers, the outer bracts erect and glabrous, inner scales few and narrow or none.
  Flowers 1 or very rarely 2 in the spike. Leaves 3 or 4 lines long.
    Scape shorter than the almost sessile spike . . . 1. *C. humillima.*
    Scape usually 1 in. long or more. Outer bract aristate . . . . 2. *C. polygyna.*
  Flowers 2 to 4 in the spike.
    Scape 1 to 3 in. Outer bract with a long slender awn. An inner scale to each flower. Carpels 3, rarely 2 or 1 . . . . 3. *C. alepyroides.*
    Scape under 1 in. Outer bract with a long awn. Inner scales very prominent . . . . . . 10. *C. aristata*, var.
    Scape about 1 in. Leaves very short. Outer bracts scarcely pointed. No inner scales . . . 4. *C. mutica.*
    Scape under 1 in. Leaves nearly as long. Outer bracts with a short awn. No inner scales. Carpels 6 to 10 . . . . 5. *C. glabra.*

Scape and leaves about ¼ in. Outer bracts with a short awn. About 2 inner scales. Carpels 6 to 10 . . . . 6. *C. muscoides.*
Scape and leaves under ½ in. Outer bracts scarcely acuminate. An inner scale. Carpel 1 . . . 7. *C. monogyna.*
Spikes ovate or broad, containing more than 4 flowers, the outer bracts glabrous or rarely with a few hairs erect or spreading, and 1, 2 or 3 scales under each flower, usually very prominent.
Leaves and scapes ½ to ¾ in. Flowers 4 to 6 in the spike.
Carpels usually fewer than 6. Southern plant . . 8. *C. pulvinata.*
Carpels usually more than 6. Tropical plant . . . 9. *C. pusilla.*
Scapes usually 1 to 2 in. Flowers 4 or more in each outer bract.
Outer bracts with long leafy points. Carpels usually 3 to 6. Southern and western species . . . 10. *C. aristata.*
Outer bracts shortly acuminate. Carpels usually 4 to 6. Southern and western species . . . . 11. *C. Drummondii.*
Outer bracts scarcely pointed. Flowers numerous. Carpels 10 to 20. Tropical species . . . . . 12. *C. Banksii.*
Spikes usually ovate or broad, the outer bracts hispid with long spreading hairs. Inner scales prominent.
Outer bracts scarcely spreading with awns usually longer than the bract.
Carpels usually 3. Styles free or nearly so. . . . 13. *C. fascicularis.*
Carpels 6 or more. Styles united to above the middle. 14. *C. pilosa.*
Outer bracts spreading with short points.
Carpels about 6. Extratropical species . . . . . . 15. *C. strigosa.*
Carpels more than 6. Flowers very numerous. Tropical species . . . . 16. *C. exserta.*

Hieronymus, Centrol. 103, retains the name of *Alepyrum* for the New Zealand *A. pallidum*, Hook. f., which I think Hooker had more correctly at first published as a *Gaimardia* of which it has the characteristic habit, and from which it only differs in having 1 instead of 2 stamens. Hieronymus also attributes to it the superposed carpels of *Centrolepis* which I do not find, the ovary is not lobed but 2- to 4-celled with 2 to 4 styles. The capsule in *G. australis* opens loculicidally in 2 valves; in *G. pallida* I found it 1-celled and 1-seeded by abortion.

1. **C. humillima**, *F. Muell. Herb.*—A minute moss-like densely tufted plant, quite glabrous. Scapes scarcely any within a few linear recurved leaves, scarcely 3 lines long, with broad scarious sheathing bases, the inner ones reduced to the scarious sheath. Floral bract one only, almost sessile within the leaves, rather broadly linear and closely embracing the flower, tapering into a recurved point not exceeding the leaves. Flower 1 only, with a scarious complicate scale opposed to the bract and enclosing the stamen. Ovary of 3 or 4 carpels, the styles united at the base.

W. Australia. Salt lagoons north of Stirling Range, *F. Mueller.*

2. **C. polygyna,** *Hieron. Centrol.* 96.—Though slender and sometimes very small this species is more rigid than its nearest allies. Leaves capillary, usually 3 or 4 lines long. Scapes in the typical form usually about 1 in. long, though occasionally more than twice or scarcely half as much, of a rather dark colour as well as the floral

bracts which are close together, narrow, erect, rigid, glabrous, about 2 lines long, the outer one with a rigid awn at least as long and sometimes above twice as long, the inner one with a very short point. Flowers solitary or very rarely 2 together in the inner or upper bract, with a thin hyaline scale in all the specimens examined. Filament usually shortly adnate to the axis of the carpels, which I have not observed in other species. Carpels varying from about 6 to above 20; styles very shortly connate.—*Alepyrum polygynum*, R. Br. Prod. 253; Hook. f. Fl. Tasm. ii. 78; Nees in Pl. Preiss. ii. 71.

Victoria. Near Brighton, Murray and Axe Rivers, *F. Mueller.*
Tasmania. Near Georgetown, *Gunn.*
S. Australia. Rivoli Bay, *F. Mueller.*
W. Australia. King George's Sound and adjoining districts, *R. Brown*, *F. Mueller*, *Drummond*, *n.* 926, *Preiss*, *n.* 1736, *Oldfield.*

Alepyrum pumilio, R. Br. Prod. 253, from King George's Sound, *R. Brown*, and from Murray River, *F. Mueller*, appears to be only a small state of *C. polygyna*, the whole plant sometimes under $\frac{1}{2}$ in. high.

3. **C. alepyroides**, *Hieron. Centrol.* 96.—Nearly allied to *C. polygyna*, but much more slender. Leaves $\frac{1}{4}$ to $\frac{1}{2}$ in. long. Scapes capillary, 1 to 3 in. long. Floral bracts glabrous, erect, under 2 lines long, not so rigid nor so brown as in *C. polygyna*, the awn of the outer one 2 or 3 times as long as the bract and very slender. Flowers 2 to 5 in the upper bract, each one subtended by a hyaline linear or oblong scale. Carpels varying from 2 to 4 or 5 but in most ovaries 3, very rarely reduced to a single one, the axis always short.—*Desvauxia alepyroides*, Nees in Pl. Preiss. ii. 71.

N. S. Wales. Specimens in herb. F. Mueller from Hastings River, *Beckler*, appear to belong to this species, rather than to *C. polygyna*, but possibly there may be some mistake.
W. Australia. Swan River, *Preiss*, *n.* 1739; Vasse and Murchison Rivers, *Oldfield.*

The dwarf plant from Tasmania which I have after F. Mueller referred as a variety to *C. aristata*, closely connects that species with *C. alepyroides.*

4. **C. mutica,** *Hieron. Centrol.* 97.—Very closely allied to *C. glabra*, but the filiform leaves are scarcely above 3 or 4 lines long, whilst the slender scape is above 1 in. high, and the floral bracts have exceedingly short points. Flowers as in *C. glabra* about 4, without any hyaline scales. Carpels of the ovary fewer than in that species.—*Alepyrum muticum*, R. Br. Prod. 253.

W. Australia. King George's Sound, *R. Brown.*

5. **C. glabra**, *Hieron. Centrol.* 95.—A small glabrous plant with the habit of *C. muscoides*, but more slender. Leaves capillary, $\frac{1}{2}$ to 1 in. long. Scapes very slender, sometimes slightly exceeding the leaves but more frequently shorter. Floral bracts close together, narrow, erect, the outer one about 1 line long besides the point or awn at least half as long, the inner one narrower, without any point. Flowers 4, of which 2 usually without any stamen, and no hyaline scales in any

of the heads examined. Carpels of the ovary about 8, rarely 10. Styles free or nearly so.—*Desvauxia glabra*, F. Muell. in Linnæa, xxviii. 226; *Alepyrum Muelleri*, Hook. f. Fl. Tasm. ii. 78.

Victoria. Mount Emu Creek, Edwards River, *F. Mueller*; Richardson River, *Miss Beal.*

Tasmania. Bottom of a lagoon on Macquarie River, *Gunn.*

W. Australia, *Drummond, n.* 929.

6. **C. muscoides,** *Hieron. Centrol.* 95.—A minute slender glabrous annual, growing in dense moss-like tufts of about ½ in. Leaves scarcely exceeding the spike, subulate, dilated at the base into imbricate sheaths, the innermost without laminæ. Floral bracts close together, erect, lanceolate, nearly 2 lines long, with short awns rather longer on the outer than the inner one. Flowers in the spikes examined 4, not separable into 2 clusters, 2 of them without stamens or hyaline scales, the 2 others with a narrow scale under the stamen. Carpels of the ovary usually 6 to 8 but sometimes only 4 or as many as 10.—*Alepyrum muscoides*, Hook. f. Fl. Tasm. ii. 77.

Tasmania. Marshy ground in subalpine situations about Marlborough, *Gunn.*

7. **C. monogyna,** *Benth.* A densely tufted moss-like plant under ½ in. high, closely resembling *C. muscoides* in foliage and habit. Leaves rather shining, with short scarious sheathing bases. Scape including the spike shorter than the leaves. Floral bracts glabrous, narrow, erect, a little distant from each other, scarcely acuminate, about 1 line long, each containing 1 hyaline scale not much shorter than the bract, 1 stamen and 1 ovary with a single carpel.—*Alepyrum monogynum*, Hook. f. Fl. Tasm. ii. 77, t. 138; *Aphelia monogyna*, Hieron. Centrol. 94.

Tasmania. Lake St. Clair and near Marlborough, *Gunn.*

This has entirely the habit and inflorescence of the smaller species of *Centrolepis*, and not at all those of *Aphelia*, in which it is placed by Hieronymus on account of the artificial character of the solitary carpel. It has moreover no male flower in the lower bract, and ovaries with a single carpel occur also occasionally in *C. alepyroides.*

8. **C. pulvinata,** *Desv. in Ann. Sc. Nat. ser.* 1, xiii. 42, *t.* 2.—A densely tufted little plant, with filiform leaves and scapes of ½ to ¾ in. Floral bracts a little distant from each other, ovate-lanceolate, spreading, very shortly pointed, scarcely above 1 line long, glabrous or the lower one slightly hairy. Flowers 1 or 2 in the upper bract, 2 or 3 in the lower one; hyaline scales rather long, 2 or sometimes 3 to each flower. Carpels of the ovary 3 to 6 or rarely 7.—Hieron. Centrol. 100; *Desvauxia pulvinata*, R. Br. Prod. 252; Guillem. Ic. Pl. Austral. t. 17.

Tasmania. Kent's Group, Bass's Straits, *R. Brown.* Said also by Hieronymus to be in South West Australia, but I have seen no specimens from thence.

9. **C. pusilla,** *Rœm. et Schult. Syst.* i. 44.—A small tufted plant with scapes and leaves of about ½ in. like *C. muscoides.* Floral bracts

close together and glabrous as in that species but somewhat spreading, obtuse or scarcely pointed, but little more than 1 line long. Flowers about 4 in the whole spike, with 1 or 2 hyaline scales to each flower rather prominent. Carpels of the ovary 6 to 7 according to R. Brown, 7 to 13 according to Hieronymus; styles free.—Hieron. Centrol. 97; *Desvauxia pusilla*, R. Br. Prod. 253.

Queensland. Point Lookout, *Banks and Solander.*

10. **C. aristata**, *Rœm. et Schult. Syst.* i. 44.—Leaves linear, sometimes very short and fine but often a few of them nearly $\frac{1}{2}$ line broad and above 1 in. long. Scapes 1 to 2 in. high, or in luxuriant Western specimens twice that height, flattened under the spike. Floral bracts close together, glabrous, ovate, erect, 2 to near 3 lines long, with long leafy points, that of the lower bract often $\frac{1}{2}$ in. and sometimes 1 in. long, the other one shorter. Flowers in each bract from 6 to about 20, intermixed with hyaline scales, some very narrow and entire, others broader and jagged at the end, always 1 under each stamen and 1 under or by the side of each ovary, with a few apparently additional ones. Carpels of the ovary few, varying from 3 or 4 to 6 or 7. Hook. f. Fl. Tasm. ii. 76, t. 138; Hieron. Centrol. 99; *Desvauxia aristata,* R. Br. Prod. 253.

Victoria, *Robertson, Harvey;* near Mount William, *Sullivan.*
Tasmania. Abundant in wet sandy soil near Georgetown and Launceston, *Gunn;* South Esk River, *C. Stuart.*
S. Australia. Bethanie, Bugle Range, etc. *F. Mueller.*
W. Australia. King George's Sound, *R. Brown, F. Mueller* and others; and thence to Swan River, *Drummond, Oldfield.*

Var.? *pygmæa*, F. Muell. A little fine-leaved tufted plant of $\frac{1}{2}$ to 1 in. with few flowers or none at all in the lower bract and 2 or 3 in the upper bract, but intermixed with hyaline scales as in the typical *C. aristata*, connecting this species with *C. alepyroides* to which perhaps the present variety is more aptly referrible.—Southport, Tasmania, *Story.*

11. **C. Drummondii**, *Hieron. Centrol.* 98.—Leaves very fine, mostly about $\frac{1}{2}$ in. Scapes capillary, 1 to 2 in. high. Spike oblong, glabrous. Floral bracts erect, about 2 lines long, shortly acuminate, one affixed from $\frac{1}{2}$ to $\frac{3}{4}$ line below the other. Flowers 4 to 6 in each bract, with 1 or 2 hyaline scales to each, the one under the stamen the largest and often toothed or jagged at the end. Carpels of the ovary 4 to 8.—*Desvauxia Drummondii*, Nees in Pl. Preiss. ii. 70; *Centrolepis pulchra*, Hieron. Centrol. 99; *Desvauxia Urvillei*, Steud. Syn. Pl. Glum. ii. 267; *Centrolepis Urvillei*, Hieron. Centrol. 100.

W. Australia. King George's Sound to Swan River, *Drummond*, 1*st coll. and n.* 930; *Preiss, n.* 1809, *D'Urville, F. Mueller, Oldfield,* **Muir** and others.

Desvauxia brevifolia, Nees in Pl. Preiss. ii. 70 (*Centrolepis brevifolia*, Hieron. Centrol. 98), from King George's Sound, *Preiss, n.* 1749, which I have not seen, is from Nees's description as corrected by Hieronymus, not different from *C. Drummondii.*

12. **C. Banksii,** *Ram. et Schult. Syst.* i. 44.—Very similar to *C. exserta*, but quite glabrous in all its parts. Leaves filiform mostly about ½ in. long, and scapes from that to 1 in. or rather more. Spike broad, the floral bracts very spreading, about 1½ lines long, ovate, acute or tapering into a short point. Flowers numerous in both bracts, the hyaline scales usually 2 to each flower and often as long as the outer bract. Carpels of the ovary from 10 to 20.—Hieron. Centrol. 99; *Desvauxia Banksii*, R. Br. Prod. 253.

N. Australia. Victoria River, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander.*

13. **C. fascicularis**, *Labill. Pl. Nov. Holl.* i. 7, t. 1.—Leaves ¾ to 1½ in. long, usually ciliate below the middle with a few long hairs. Scapes slender, 1 to 3 in. high, glabrous or rarely sprinkled with a few short hairs. Floral bracts at a short distance from each other, ovate, hispid with long rigid hairs, 1½ to 2 lines long, with glabrous awns about the length of the bract or that of the lower bract longer. Flowers 4 to 8 in each bract, a hyaline scale under each stamen often as long as the bract and toothed at the end, and usually but not always a smaller scale under or by the side of each ovary. Carpels of the ovary 2 to 4; usually 3; styles nearly free.—Desv. in Ann. Sc. Nat. ser. 1. xiii. t. 2; Endl. Iconogr. t. 49; Hook. f. Fl. Tasm. ii. 77; Hieron. Centrol. 102; *C. cuspidigera*, Rudge in Trans. Linn. Soc. x. 283, t. 12; *Desvauxia Billardieri*, R. Br. Prod. 252; *D. longifolia*, Gaudich in Freyc. Voy. Bot. 418.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart.*
Victoria. Fitzroy River, *Robertson*; Grampians, *F. Mueller.*
Tasmania. Port Dalrymple, *R. Brown*; abundant in wet heathy places, *J. D. Hooker.*
S. Australia. Mount Lofty Ranges, *F. Mueller.*

14. **C. pilosa,** *Hieron. Centrol.* 102.—Very closely allied to *C. fascicularis*, with the same stature, foliage, hairs, and bracts, but the ovary appears constantly to have 6 or more carpels, and the styles are connate to a considerable height.

W. Australia, *Drummond.*

15. **C. strigosa**, *Ram. et Schult. Syst.* i. 43.—Habit nearly that of *C. fascicularis.* Leaves often 1 in. long, hispid with rather rigid but not numerous hairs. Scapes usually rather longer than the leaves. Floral bracts placed near together, ovate, spreading, more or less hispid with long hairs, about 1½ lines long, with a spreading glabrous point usually shorter than the bract. Flowers usually 6 to 8 rarely more in each bract, each flower with 3 unequal hyaline scales, the larger one, under the stamen, as long as the outer bract, the others smaller or one sometimes deficient. Carpels about 6 to each ovary; styles shortly connate or almost free.—Hieron. Centrol. 101; *Desvauxia strigosa*, R. Br. Prod. 252; Guillem. Ic. Pl. Austral. i. 17.

N. S. Wales. Port Jackson, *R. Brown*, *R. Cunningham* and others.
W. Australia. King George's Sound, *R. Brown*, *Fraser*, *Drummond;* Middle Island, *Maxwell.* There does not appear to be any difference between the Eastern and Western specimens.

Var. *Patersoni.* Upper floral bract glabrous or nearly so, in other respects precisely the typical form.—*Desvauxia Patersoni*, R. Br. Prod. 252; *Centrolepis æmula*, Rudge in Trans. Linn. Soc. x. 284, from the synonym, but the figure t. 12 f. 2 is that of the typical *C. strigosa* with both the bracts hispid; *C. Patersoni*, Rœm. et Sch. Syst. 1. 43; Hieron. Centrol. 100.—Port Jackson, *R. Brown.*

Var. *tenuior.* Usually smaller than the typical form, the floral bracts with very short or scarcely any points, and the third hyaline scale to each flower very small or deficient.—*Desvauxia tenuior*, R. Br. Prod. 252; *Centrolepis tenuior*, Rœm. et Schult. Syst. i. 43; Hook. f. Fl. Tasm. ii. 76; Hieron. Centrol. 101.

N. S Wales. Port Jackson, *Woolls.*
Victoria. Yarra, Snowy River, etc. *F. Mueller.*
Tasmania. King's Island, *R. Brown;* various localities, *Gunn*, *Archer*, *Story* and others.
S. Australia. Bugle Range, *F. Mueller.*

16. **C. exserta,** *Rœm. et Schult. Syst.* i. 44.—Leaves shortly hairy, under 1 in. long. Scapes slender, pubescent or glabrous, 1 to 3 in. high. Floral bracts placed near together, very spreading, ovate-lanceolate, shortly awned or mucronate, hispid, about 2 lines long. Flowers numerous in each bract; hyaline scales usually 2 to each flower, nearly as long as the outer bract, often jagged at the end, and sometimes a third small one. Carpels of the ovary 6 to 10; styles very shortly connate.—Hieron. Centrol. 101; *Desvauxia exserta*, R. Br. Prod. 253; Guillem. Ic. Pl. Austral. t. 17.

N. Australia. Providence Hill and M‘Adam Range, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander;* the same coast but particular station forgotten, *R. Brown;* North Queensland, *Armit.* *C. cambodiana*, Hance, from South China differs from this species chiefly in the larger size of all its parts.

ORDER CXLII. RESTIACEÆ.

Flowers unisexual, or very rarely and exceptionally hermaphrodite, mostly diœcious, either in spikelets, with imbricate dry rigid bracts or *glumes*, 1 under each flower and usually a few outer ones empty, or in 2 genera in narrow or spikelike panicles, the glumes not imbricate. Perianth of 6, rarely 5, 4 or 3 glumelike or scarious erect segments in 2 rows. Male flowers: Stamens 3, filaments filiform and free or united in a column; anthers oblong 1-celled and dorsally attached, or in 3 genera 2-celled with the cells dorsally attached in the centre only, the cells always opening by a longitudinal slit, a rudimentary ovary occasionally present in the centre of the flower. Female flower: Staminodia in some species 3, short and filiform with or without rudimentary anthers, in others entirely wanting. Ovary sessile or shortly stipitate, 1- 2- or 3-celled, with 1 pendulous ovule in each cell. Styles as many as cells, usually long linear or filiform and stigmatic along the

inner side from below the middle or almost to the base, all free or more or less united at the base. Fruit dry, often hard, usually small, either 2- or 3-celled and 2- or 3-angled, opening along the angles, or 1-celled and either opening along 1-side, or an indehiscent nut. Seeds 1 in each cell, attached at or near the top, usually striate or minutely tubercular-rugose; testa appressed; albumen usually mealy. Embryo small, lenticular or obovoid, at the base of the albumen, at the end remote from the hilum.—Herbs usually perennial, with a rush-like or sedge-like habit, either with a tufted base or hard horizontal or creeping rhizome usually covered with closely-imbricate scales. Stems simple or branched, erect or flexuose and variously twisted. Leaves none or few, radical and long linear or sedge-like, but the stems usually bear at the base several closely imbricate dry scales and higher up a few sheathing scales the margins closed but not connate into a cylinder at least at the base, occasionally open at the upper end and often bearing a short or lengthened point or imperfect lamina, the upper sheaths, under the inflorescence and its branches, transformed into floral bracts, usually shorter, broader and more open than the stem-sheaths and sometimes the last long broad and spatha-like. Spikelets solitary or clustered and sessile or pedicellate within each floral bract, the flowers when in spikelets sessile or very shortly pedicellate without bracteoles and concealed under the glume, or when not in close spikelets having usually but not always a pair of bracteoles at their base.

The order is almost limited to extratropical South Africa, Australia and New Zealand. Of the eleven Australian genera two of the largest are also numerous in South Africa but without any identical species, one of them also represented in New Zealand, the other 9 are endemic.

Restiaceæ are closely allied in habit and inflorescence to *Cyperaceæ* and in the perianth to *Junceæ* but readily distinguished from both by the pendulous ovules and seeds. The great dissimilarity in habit and inflorescence between the males and females of some species often renders even their generic determination very difficult or uncertain from dried specimens, where only one sex is present or the sexes are mismatched. In some cases indeed the males of species belonging to different genera are more like each other than those of congeneric species, and, notwithstanding the copious materials before me, there are still some species in which I may not have correctly matched the two sexes, and in several others one sex is still unknown.

Ovary 2- or 3-celled. Styles or style branches 2 or 3.
Anthers 2-celled.
Flowers in spikelets with imbricate glumes. Male spikelets several-flowered. Filaments connate. Female spikelets 1-flowered . . . . 1. LYGINIA.
Flowers in a single terminal spikelet with imbricate glumes, either androgynous or the male and female similar. Stamens free . . . . 2. ECDEIOCOLEA.
Flowers in narrow or spikelike panicles, the glumes not imbricate and 2 bracteoles under each flower. 3. ANARTHRIA.
Anthers 1-celled.
Flowers in narrow or spike-like panicles, the glumes scarcely imbricate and usually 2 bracteoles under each flower . . . . 4. LEPYRODIA.
Flowers in spikelets with imbricate glumes, the spikelets several-flowered in both sexes or the females 1-flowered. . . . . 5. RESTIO.

Ovary 1-celled with a single ovule. Styles or style branches 3.
  Female spikelets several-flowered as well as the males. Pericarp usually opening laterally . . 6. Leptocarpus.
  Female spikelets 1-flowered. Nut indehiscent . . 7. Hypolæna.
Ovary 1-celled with a single ovule. Style undivided.
  Female spikelets 1-flowered. Stems much-branched. Sheathing scales persistent . . . . 8. Loxocarya.
  Female spikelets several-flowered as well as the males. Stems mostly simple. Sheathing scales very deciduous . . . . 9. Lepidobolus.
  Female spikelets densely clustered. Perianth of 3 narrow hyaline segments and 3 cilia. Males unknown . . . . 10. Chætanthus.
  Spikelets in both sexes solitary, terminal, several-flowered. Perianth of 3 narrow-clawed hyaline segments . . . . 11. Onychosepalum.

Chætodiscus Gilberti, Steud. Syn. Pl. Glum. ii. 261, is too imperfectly described for identification but is probably Cyperaceous.

1. LYGINIA, R. Br.

Flowers diœcious, the males several together, the females solitary, in spikelets with imbricate glumes. Perianth-segments 6, glume-like, not exceeding the glumes. Male flower: Stamens 3, the filaments united almost to the top; anthers of 2 distinct cells dorsally attached in the centre only. Female flower: No staminodia. Ovary 3-celled; styles 3, shortly united at the base. Capsule 3-angled, opening at the angles.—Stems simple, with distant sheathing scales. Spikelets few, sessile and distant along a simple rhachis, or the females sometimes solitary and terminal.

The genus is limited to the single species, endemic in West Australia.

1. **L. barbata,** *R. Br. Prod.* 248.—Rhizome creeping, covered as well as the base of the stems with closely imbricate shining brown scales. Stems simple, erect or flexuose, rather slender, 1 to 2 ft. high. Sheathing scales appressed, ciliate at the top with long hairs and tapering into a spreading point in the typical form, with shorter points and few or no hairs in some varieties. Males: Floral bracts from 3 or 4 to 12 or more in an interrupted terminal spike, more or less acuminate or produced into a long point, densely or sparingly ciliate or quite glabrous. Spikelets closely sessile within the bract and scarcely protruding from it, solitary within each bract or rarely 1 or 2 additional imperfect spikelets in the lowest bract. Glumes dark brown, acuminate, nearly 3 lines long, most of them flowering, with few empty ones at the base. Perianth-segments nearly equal, rather shorter than the glumes. Filaments united in a long slender tube. Females: Spikelets few and often only a single terminal one. Glumes of the same length but broader than in the males, acuminate with a fine point, all empty but enclosing a single terminal flower. Perianth-segments nearly equal, rigid, acute, very much imbricate and rolled round the

ovary, rather shorter than the glumes. Style short and thick, with long plumose stigmatic branches. Capsule depressed, thick and hard, the angles very prominent.—Nees in Pl. Preiss. ii. 61; *L. symphyonema*, F. Muell. Fragm. viii. 79; *Schœnodum tenax*, Labill. Pl. Nov. Holl. ii. 80, t. 229 as to the male plant.

W. Australia. King George's Sound, *R. Brown* and others and thence to Swan River, *Drummond* 1st. coll. and n. 953 (♂) 952 (♀), Preiss, n. 1699, 1700, 1701; Murchison River, *Oldfield*.

L. imberbis, R. Br. Prod. 248. Nees. in Pl. Preiss. ii. 61, also from King George's Sound, only differs from the typical form in the want of the long hairs or cilia bordering the sheaths and bracts, but these hairs are often so few as gradually to connect the bearded with the unbearded specimens.

2. ECDEIOCOLEA, F. Muell.

Flowers unisexual, in a terminal spikelet with imbricate glumes. Perianth-segments 6, glume-like, not exceeding the glumes. Male flowers: Stamens 3, the filaments free; anthers of 2 distinct cells dorsally attached in the centre only. Female flowers: Staminodia 3. Ovary 2-celled, styles 2, free and stigmatic almost from the base. Capsule unknown.—Stems simple, with a single sheathing scale besides the imbricate ones at the base. Spikelets solitary.

The genus is limited to the single species, endemic in West Australia.

1. **E. monostachya,** *F. Muell. Fragm.* viii. 236.—Stems from a creeping rhizome erect, rigid but rather slender, $1\frac{1}{2}$ to 2 ft. high. Sheathing scales at the base brown and shining, rigid, closely imbricate, short except the innermost which is often produced into a cylindrical sheath of 3 or 4 in., and on the stems only 1 closely appressed cylindrical sheath several in. below the inflorescence. Spike or spikelet oblong-conical or at length nearly cylindrical, $\frac{3}{4}$ to 1 in. long, of a dark brown, closely resembling that of *Lepironia* among Cyperaceæ but strictly terminal. Glumes ovate, obtuse, very numerous, rigid and closely imbricate, about 2 lines long, 2 or 3 of the outer ones shorter and empty, but no sheathing bract immediately under the spike. Perianth in both sexes very flat, about as long as the glumes, glabrous or slightly hairy at the tips, 2 outer segments concave-complicate, the third very flat and rather broad, 3 inner ones narrow and concave. Filaments rather short. Styles long.

W. Australia. *Drummond, 4th coll. n.* 342; Murchison River, *Oldfield*.

The flowers according to F. Mueller are diœcious, the only female flower however which I have been able to examine was taken from a spike in which there were certainly several males. The specimens are too few to determine whether the plant is habitually diœcious or androgynous.

3. ANARTHRIA, R. Br.

Flowers diœcious or rarely monœcious, in narrow or spike-like panicles, the glumes not closely imbricate and shorter than the perianths. Perianth-segments 6, glume-like. Male flowers: Stamens 3; filaments free; anthers of 2 distinct cells, dorsally attached in the centre only. Female flowers: No staminodia. Ovary 3-celled; styles 3, elongated, distinct, stigmatic almost or quite from the base. Capsule 3-angled or 3-lobed, opening at the angles.—Stems simple or branched, often flattened. Leaves long, radical or sheathing at the base of the stem. Long leafy bracts under the branches or inflorescence. Two bracteoles within the glume under each flower.

The genus is limited to West Australia.

Stems simple, more or less flattened. Panicle narrow, many-flowered, with a long deciduous leaf-like bract at the base.
  Stem and leaves very flat, 3 to 4 lines broad . . . . . 1. *A. scabra.*
  Stem and leaves flat, 2 to 3 lines broad . . . . 2. *A. lævis.*
  Stem and leaves slightly flattened, under 1 line broad . . 3. *A. gracilis.*
Stems much branched. Panicles numerous, 3- to 6-flowered.
  Stems flattened, the numerous branches loosely curved or flexuose . . . . 4. *A. prolifera.*
  Stems scarcely flattened, the branches erect and bushy, leafy throughout . . . . 5. *A. polyphylla.*

1. **A. scabra,** *R. Br. Prod.* 249.—Stems erect, rigid, very flat, 1 to 2 ft. high and 3 to 4 lines broad. Leaves all radical, as long and broad as the stems or rather longer, sheathing distichous and equitant at the base, the margins both of stems and leaves often scabrous-serrulate but sometimes quite smooth. No sheathing scales along the stem, but long leaf-like erect bracts under the inflorescence and one or two of its principal branches, all very deciduous leaving a prominent transverse line. Male flowers in a narrow dense thyrsoid panicle 4 to 6 in. long with numerous erect branches. Flowers nearly sessile on the branches at a little distance from each other, each one within a short lanceolate acuminate brown but thin bract or glume, with a pair of smaller bracteoles at the base of the very short pedicel. Perianth-segments narrow, acuminate, of a rich brown, 2 to 2½ lines long. Filaments shorter than the anthers, in the centre of a flat receptacle. Female flowers sessile or on very short curved rigid pedicels in the notches of a thick flat and flexuose simple or shortly branched rhachis, with a very narrow acuminate bract or glume and 1 or 2 bracteoles under each flower. Perianth-segments lanceolate, acuminate, 3 outer 5 to 6 lines long, 3 inner rather smaller. Capsule hard, laterally 3-lobed, about 3 lines broad, crowned by 3 short points, the bases of the styles.—Nees in Pl. Preiss. ii. 61; F. Muell. Fragm. viii. 80.

W. Australia. King George's Sound and adjoining districts, *R. Brown, A. Cunningham, Drummond, n.* 249 *and* 271; *Preiss, n.* 1730; *F. Mueller* and others.

2. **A. lævis,** *R. Br. Prod.* 249. Stems 1 to 1½ ft. high, flat and rigid, with leaves as long as in *A. scabra* and similarly sheathing and equitant at the base, but both leaves and stem narrower, usually about 2 lines and always under 3 lines broad with smooth margins, the inflor-

escence much more compact and the flowers smaller. Male thyrsus dense, under 3 in. long, the outer leafy bracts or spathas very deciduous. Flowers nearly sessile within broad thin jagged bracts or glumes much shorter than the perianth, and 1 or 2 small lanceolate bracteoles. Perianth-segments brown, thin, lanceolate, about 2 lines long. Female inflorescence very dense, 1 to near 2 in. long. Glumes under the flowers very broad and often jagged. Perianth-segments about 1 line long, very broad. Ovary tapering into 3 long stigmatic styles.—Nees in Pl. Preiss. ii. 61; F. Muell. Fragm. viii. 81.

W. Australia. King George's Sound and Lucky Bay, *R. Brown*, *Baxter*; and probably from the same neighbourhood, *Drummond*, *n.* 343, 370, 866; *Preiss*, *n.* 1813, 1814, 1817; Forest Hill, *Muir*.

3. **A. gracilis,** *R. Br. Prod.* 249.—Stems usually about 1 ft. high, slightly flattened but like the leaves under 1 line broad, with obtuse smooth margins, and the leaves tapering into fine rigid points or sometimes nearly the whole lamina subulate. Inflorescence narrow and spike-like, 1½ to 2 in. long, with short erect branches. Leaf-like spathaceous bracts under the principal branches very acute, mostly longer than the spike and rather more persistent than in the preceding species. Flowers sessile within hyaline or scarcely coloured glumes shorter than the perianth. Male flowers: Perianth-segments lanceolate, acute, light brown, about 3 lines long or in small specimens rather shorter; filaments rather short. Female flowers: Outer perianth-segments lanceolate, acute, about 2 lines long, the inner ones shorter, more obtuse and almost hyaline. Three staminodia in some specimens, none in others.—F. Muell. Fragm. viii. 81; *A. humilis* and *A. grandiflora*, Nees in Ann. Nat. Hist. ser. 1. vi. 50, and in Pl. Preiss. ii. 63; *A. ischæmoides* and *A. canaliculata*, Nees in Pl. Preiss. ii. 62.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller* and others, and thence to Swan River, *Drummond 1st coll. n.* 904, also *n.* 73, 203, 344; *Preiss*, *n.* 1815.

Amongst F. Mueller's specimens there is one with the upper flowers female, whilst those at the base of the inflorescence are males.

4. **A. prolifera,** *R. Br. Prod.* 249.—Stems flattened, 1 to 1¼ lines broad with acute edges, divided from near the base into flexuose or curved branches, usually clustered within the sheaths and the whole specimens extending to 1 to 2 ft. Radical leaves not numerous, as broad as the stem, 3 to 6 in. long, those under the branches gradually reduced to sheathing bracts open from the base; the lowest often 4 to 6 in. long, the upper ones much shorter, and within them are often 2 short brown sheathing bracts round the principal branch. Inflorescences terminating the flexuose branches or peduncles, usually reduced to 2 or 4 flowers. Perianth-segments in both sexes lanceolate, acute, about 4 lines long, or rather shorter in the females.—F. Muell. Fragm. viii. 82; *A. lævis*, *var.* Nees in Pl. Preiss. ii. 62.

W. Australia. King George's Sound, *R. Brown*, *Collie*, *Preiss*, *n.* 1727, *F. Muller* and others; common in the sands, *Oldfield*; Swan River, *Miss Lukin.*

A. pauciflora, R. Br. Prod. 249, is founded on a single fragment from King George's Sound, which appears to me to be a branch from a slender specimen of *A. prolifera.*

5. **A. polyphylla,** *Nees in Pl. Preiss.* ii. 63.—Stems erect, slender, terete or slightly flattened, branching and almost bushy and leafy throughout, 6 to 8 in. high. Leaves subulate, mostly 2 to 3 in. long, with fine points, dilated into sheathing bases covering the stem but I do not find them distichous as described by Nees. Male inflorescence terminal, shortly pedunculate, simple or scarcely branched, shorter than the leaves and consisting usually of 3 to 6 flowers, the spathaceous bract at the base of the inflorescence lanceolate, acuminate, not exceeding the flowers, the glumes or bracts under each flower still shorter. Outer perianth-segments narrow-lanceolate, acute, nearly 3 lines long, the inner ones rather shorter and more obtuse. Filaments nearly as long as the segments and anthers about as long.—F. Muell. Fragm. viii. 83.

W. Australia, *Drummond*; near Gordon River, *Preiss*, *n.* 1691.

Some female specimens gathered by F. Mueller and referred by him to *A. prolifera*, appear to me rather to belong to the present species. They are more elongated than the males, attaining nearly 1 ft., but have the same narrow scarcely flattened stems and long-pointed leaves. The perianth-segments are however nearly 4 lines long and very acute.

4. LEPYRODIA, R. Br.

Flowers diœcious, monœcious, or rarely hermaphrodite, in narrow or spike-like panicles, the glumes not closely imbricate and shorter than the perianths. Perianth-segments 6, glume-like or thin and almost hyaline. Male flowers: Stamens 3, filaments free; anthers 1-celled. Female flowers: Staminodia usually 3, filiform clavate or with an abortive anther. Ovary 3-angled, 3-celled; styles 3, either distinct or more or less connate at the base, linear, stigmatic from the middle or almost from the base. Capsule 3-lobed or 3-angled, opening at the angles.—Stems simple or branched, leafless except the sheathing scales. Male and female inflorescences not very different. Bracteoles under each flower within the glume usually 2, deficient however in two species.

The genus is limited to extratropical Australia.

Eastern species. Outer perianth-segments as long as or longer than the inner.
  Tall plant. Sheathing scales loose. Floral bracts with long points . . . . 1. *L. scariosa.*
  Tall plant. Sheathing scales appressed. Floral bracts obtuse or shortly acuminate . . . . . 2. *L. Muelleri.*
  Stems very slender, apparently without sheathing scales. Spike-like panicle short and nearly simple . . . . 3. *L. anarthria.*

Eastern species. Outer perianth-segments at least in the males shorter than the inner. Sheathing scales closely appressed.
Stems slender, erect, scarcely branched, with a single spike-like panicle . . . . 4. *L. gracilis.*
Stems much-branched, erect or long and loose. Spikes narrow, usually numerous and paniculate . . . 5. *L. tasmanica*
Stems loosely branched. Flowers in almost sessile distant clusters along the branches . . . . . 6. *L. interrupta.*
Western species. Inflorescence normal, with bracteoles to each flower within the glume.
Stems branched at the base, about 4 in. high. Sheathing scales very deciduous. Flowers hermaphrodite . . . . 7. *L hermaphrodita.*
Stems much-branched, near 1 ft. Sheathing scales persistent. Flowers monœcious . . . . 8. *L. monoica.*
Stems nearly simple, erect. Sheathing scales persistent. Outer perianth-segments shorter than the inner.
Glumes and bracteoles acute not aristate . . . . 9. *L. Muirii.*
Glumes and bracteoles aristate with fine points. . 10. *L. stricta.*
Stems nearly simple. Sheathing scales very deciduous leaving annular scars.
Stems densely tufted. Male perianths a little above 1 line long . . . . 11. *L. macra.*
Stems from a thick creeping rhizome. Male perianths about $2\frac{1}{2}$ lines long . . . . 12. *L. Drummondiana.*
Western species. Flowers clustered in the panicles without bracteoles. Sheathing scales loose.
Sheathing scales erect. Perianth-segments acute or awned . . . . 13. *L. glauca.*
Sheathing scales spreading. Perianth-segments obtuse . . . . 14. *L. anæctocolea.*

1. **L. scariosa,** *R. Br. Prod.* 248.—Rhizome creeping. Stems erect, terete, glabrous, 1 to 2 ft. high. Sheathing scales brown, loose, often above 1 in. long and in some luxuriant specimens 2 in., the upper ones with short points. Inflorescence a narrow pale brown thyrsoid panicle, with short unequal erect branches, the lower ones often distant, the others more crowded. Bracts under the lower branches rigid with long points, under the upper branches smaller, broader and more scarious. Flowers sessile or shortly pedicellate within scarious glumes shorter than the perianth and 2 hyaline bracteoles at the base of the pedicel, sometimes very short, sometimes almost as long as the glume. Perianth-segments in both sexes about 2 lines long, lanceolate, acute, pale brown. Male flowers with a small rudiment of the ovary, females with slender staminodia.—F. Muell. Fragm. viii. 72; *L. hermaphrodita*, Nees in Sieb. Pl. Exs. n. 51, not of R. Br.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; New England, *C. Stuart.*

2. **L. Muelleri,** *Benth.*—Rhizome creeping. Stems erect, often 2 ft. high or more. Sheathing scales appressed, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, some with rather long leafy points, the bracts under the inflorescence broad and loose, mostly without points. Flowers in compound spikes or

short dense often androgynous thyrsoid panicles, a terminal one of ¾ to 1 in. and several smaller distant ones sessile or pedunculate within the sheathing bracts. Bracts within the inflorescence and glumes more scarious, obtuse or acuminate, broad or narrow. Perianth-segments in both sexes 1 to 1½ lines long, acute, the inner ones of the same length as or rather shorter than the outer.—*L. tasmanica*, F. Muell. Fragm. viii. 75, not of Hook. f.; *L. stricta*, F. Muell. Herb., not of R. Br.

Victoria. From Port Phillip to Gipps' Land, *F. Mueller.*
Tasmania. South Esk River, *C. Stuart.*
S. Australia. Near Mount Gambier, *F. Mueller.*

3. **L. anarthria,** *F. Muell. Fragm.* viii. 73.—Stems very slender, undivided, the longest in our specimens 16 in. long, without any sheathing scale or node, except at the base where there are a few short leaves with sheathing bases. Panicle narrow, dense and spike-like resembling that of *L. gracilis*, 1 to 1½ in. long. Flowers in the specimens all female, the outer perianth-segments acutely acuminate, about 1¼ lines long, the inner narrower and rather shorter. Bracts scarious as in L. *scariosus*, but soon withering away. Capsule small, 3-celled, quite normal.—*Anarthria gracilis*, Nees in Sieb. Pl. Exs. n. 50; Kunth, Enum. iii. 478, but not of R. Br.

N. S. Wales. Port Jackson, or Blue Mountains, *Sieber*. Possibly a variety of *L. gracilis*, but the half dozen specimens I have seen in different herbaria are all without sheathing scales as in *Anarthria*, and the inner perianth-segments are certainly not longer than the outer.

4. **L. gracilis,** *R. Br. Prod.* 247.—Rhizome creeping, glabrous. Stems slender with a few long erect slender terete branches, 1 to 1½ ft. high. Sheathing scales appressed, or the upper ones rather loose. Flowers small, almost all shortly pedicellate in narrow almost spike-like panicles, a terminal one of 1 to 1½ or rarely 2 in. and often one or two smaller ones lower down, the bracts and glumes all small. Perianth-segments narrow, acutely acuminate, the inner ones scarcely 1 line long, the outer considerably shorter especially in the males, the females similar or the segments rather less unequal.—F. Muell. Fragm. viii. 73; *L. stricta*, Nees in Sieb. Pl. Exs. n. 32, not of Br.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 32 *and* 46, *F. Mueller* and others.

5. **L. tasmanica,** *Hook. f. Fl. Tasm.* ii. 72, t. 135.—Stems in the typical form from a creeping rhizome erect, branching from near the base, 1 to 2 ft. high, the branches long, slender and erect. Sheathing scales acuminate, appressed or the upper ones rather loose, often 1 in. long. Spikes numerous, short and slender, in a narrow terminal panicle, the upper bracts and glumes scarious. Male perianth-segments very acutely acuminate, the inner ones rather more than 1 line long, the outer ones considerably shorter. Female perianth similar but the segments nearly equal. Staminodia conspicuous, usually bearing small abortive anthers. Capsule small.

Tasmania. Detention River near Circular Head and Lake St. Clair, *Gunn*; Southport, *C. Stuart*; Gibson's Plains, *F. Mueller*.

Var. *laxa*. Stems long, weak, often decumbent, spikes much fewer and fewer-flowered, usually distant along the branches. I can find no other difference.—*L. paniculata*, F. Muell. 2d. Gen. Rep. 16 (name only); Fragm. viii. 73.

Victoria. Grampians, *F. Mueller* and others.

6. **L. interrupta,** *F. Muell. Fragm.* viii. 74.—Stems very slender, undivided or branched, often above 1 ft. long. Sheathing scales when below the branches closely appressed, rigid, with a short reflexed very deciduous point, those under the branches and clusters of flowers broad, loose, light-coloured or the upper ones scarious. Flowers in sessile clusters distant along the end of the stem, each cluster in the axil of a broad loose sheathing bract of 2 or 3 lines, the female flowers only 3 or 4 in the cluster, the male clusters more developed with more flowers. Glumes and bracteoles scarious, acutely acuminate, not much shorter than the perianths. Perianth-segments rigid, very acute, a little more than a line long, all nearly equal in the females, the inner ones longer and broader than the outer in the males. Filaments short in the males. Staminodia prominent in the females.

Queensland. Moreton Island, *F. Mueller*; Brisbane River, *Bailey*.
N. S. Wales. Port Jackson, *F. Mueller*.

Var. *flexuosa*. Older flowering branches emitting slender very flexuouse branches, often climbing to a considerable length like those of *Hypolæna gracillima*.

Victoria. Grampians, *Sullivan*. This plant referred to by F. Mueller, Fragm. viii. 76, appears to me to consist of elongated late branches of *L. interrupta*, the main stem from which they proceed with the broad loose sheathing scales and old clusters of flowers are quite those of that species.

7. **L. hermaphrodita,** *R. Br. Prod.* 248.—Stems shortly branching and densely tufted at the base without any creeping rhizome, erect or curved, usually about 4 in. high. Sheathing scales rather loose, all except the lowest very deciduous leaving annular scars. Spikes terminal, interrupted, nearly simple, about ½ in. long, the flowering bracts scarcely 2 lines long, brown and rigid but very deciduous. Flowers hermaphrodite, sessile or shortly pedicellate, solitary or 2 together within the lower bracts. Glumes and bracteoles short and scariose. Perianth-segments acutely acuminate, a little above 1 line long, all nearly equal. Anthers shortly exserted. Capsule small, 3-lobed, quite normal.—Desv. in Ann. Sc. Nat. ser. 1, xiii. t. 3. f. 3; F. Muell. Fragm. viii. 75.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller*.

8. **L. monoica,** *F. Muell. Fragm.* viii. 76.—Stems divided almost from the base into numerous erect branches nearly 1 ft. high, most of them slender and often clustered but here and there one much stouter out-topping the others. Sheathing scales at the base of the stem short broad and imbricate and sometimes a closely appressed one on the undivided part, but usually only under the branches and then broad

loose and persistent. Flowers monœcious like those of *L. macra*, but the spikes more slender and interrupted, often irregularly compound and so numerous as to form an irregular much-branched panicle. Perianth-segments acute, a little above 1 line long, the greater number in our specimens females with staminodia, but several males mixed amongst them.

W. Australia, *Drummond, n.* 447.

Var.? *foliosa*, F. Muell. Several of the sheathing scales enclosing, besides 1 or 2 branches, several linear leaves in the same cluster, each consisting of a short scarious sheathing base and a linear lamina of ½ to 1 in. or even longer.—Perongerup, *F. Mueller.*

9. **L. Muirii,** *F. Muell. Fragm.* viii. 78.—Rhizome thick and creeping. Stems rather slender but rigid, erect and undivided in all the specimens seen, from about 1 ft. to above 2 ft. high. Sheathing scales closely appressed, rarely above ½ in. long, the primary bracts in the panicle also appressed, those under the smaller branches minute. Panicle long narrow and interrupted, or when short almost spike-like. Glumes and bracteoles acute but not aristate, shorter than the perianths. Male flowers: Perianth-segments rather acute, rigid, scarcely above 1 line long, the outer segments rather shorter. Rudimentary ovary small within the stamens. Female flowers: Perianth-segments more equal rather smaller and more obtuse than in the males. Staminodia conspicuous. Styles 3 long and slender. Capsule under 1 line broad.

W. Australia, *Drummond, n.* 106 ♂, *and* 107 ♀; King George's Sound, *F. Mueller*; Lake Muir, *Muir*; Busselton, *Pries.* The species comes very near to the eastern *L. gracilis.*

10. **L. stricta,** *R. Br. Prod.* 248.—Rhizome hard and dense but probably creeping. Stems erect, simple or with a few long erect branches, mostly above 1 ft. and sometimes above 2 ft. high. Sheathing scales closely appressed or those under the branches scarcely loose, ½ to 1 in. long. Bracts under the panicle narrow, rigid, erect, under ½ in. long, those under the branches passing into the aristate glumes. Panicle thyrsoid, compact, usually narrow and 1 to 2 in. long, but sometimes more developed branching and 3 to 4 in. Glumes and bracteoles thin, more or less produced into fine capillary awns or points. Perianth in both sexes a little more than 1 line long, with the outer segments rather shorter than the inner.—*L. succedanea*, Nees in Pl. Preiss. ii. 60; F. Muell. Fragm. viii. 74.

W. Australia. King George's Sound and adjoining districts, *R. Brown, Drummond, Preiss, n.* 1710, *F. Mueller* and others. As far as our specimens go this and the preceding species appear to be diœcious, although the two sexes are very similar in their inflorescence and perianths.

11. **L. macra,** *Nees in Pl. Preiss.* ii. 60.—Stems densely tufted but without the creeping rhizome of *L. Drummondiana* or the branching base of *L. hermaphrodita*, erect, slender, 6 in. to above 1 ft. high. Sheathing scales, except the few imbricate ones at the base of the stem,

all very deciduous leaving annular scars; floral bracts thin, lanceolate, 3 to 4 lines long, also very deciduous. Spikes simple or slightly compound, about 1 in. long as in *L. hermaphrodita* and flowers very nearly of that species with very acute perianth-segments a little above 1 line long, but apparently monœcious, not hermaphrodite, our specimens however are all in fruit except occasionally some of the upper ones have a rudimentary ovary with 3 long filaments having lost their anthers.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 902.

F. Mueller, Fragm. viii. 75, refers this to *L. hermaphrodita*, but besides the habit and stature the flowers in our specimens are certainly unisexual. Those described by Nees were small and starved, but the Kew and other collections contain others more than twice their size with a much more luxuriant inflorescence.

12. **L. Drummondiana,** *Steud. Syn. Glum.* ii. 248.—Rhizome creeping. Stems erect or flexuose, simple, rather slender, mostly about 1 ft. high. Sheathing scales appressed but very deciduous leaving annular scars, the few imbricate short broad obtuse ones at the base of the stem alone persisting, some of the lowest sometimes bearing leafy appendages; flowering bracts also very deciduous, lanceolate and thin. Short spikes or clusters simple or compound, sessile within each bract, forming an interrupted terminal spike-like panicle, similar in the males and females. Glumes thin, lanceolate, the lower ones as long as the flowers; bracteoles shorter, thin, acutely acuminate. Male flowers: Outer perianth-segments rigid, acutely acuminate, 2½ lines long, the inner ones rather shorter. Female flowers similar but smaller, the whole perianth scarcely 2 lines long. Staminodia small. Capsule normal but not so broad for its length as in most species.—F. Muell. Fragm. viii. 75.

W. Australia, *Drummond, n.* 395 ♂, and 347 ♀.

13. **L. glauca,** *F. Muell. Fragm.* viii. 77.—Rhizome thick and creeping. Stems stout, rigid, erect, 2 or 3 ft. high, simple or with a few long erect branches. Sheathing scales loose but erect, often 1 to 2 in. long. Panicle narrow, interrupted, 3 or 4 in. long with sometimes a spike much lower down. Sheathing bracts under the main branches ovate-lanceolate, the lowest ½ to ¾ in. long, but passing gradually into the short ovate almost scarious bracts under the smaller branches, and these again into the still smaller ovate scarious glumes, the last bracts enclosing a head of 3 to 7 almost sessile flowers, each within a small scarious glume without bracteoles, except the central flower in the females, which has usually 1 or 2 bracteoles within the glume. Perianth in both sexes about 1 line long, the outer segments with a fine point or short awn, the inner ones rather longer and acute, without any awn. No rudimentary ovary in the males and staminodia rare in the females. Capsule about 1 line diameter, rather broader than long. Style variable, in some flowers with very small perhaps imperfect ovules the style is at least twice as long as the ovary and divided to the middle only, in others with more perfect ovules, the whole style is scarcely longer than

the ovary and divided almost to the base.—*Leptocarpus glaucus*, Nees in Pl. Preiss. ii. 64.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1693; Blackwood and Gordon Rivers, *Oldfield;* Busselton, *Pries.*

14. **L. anæctocolea,** *F. Muell. Fragm.* viii. 78.—Rhizome hard and creeping; stems erect; about 2 ft. high, rather slender, with erect branches, terete below the branches, but the branches semi-terete with the flat sharp-angled sides facing each other. Sheathing scales loose, 1 in. long or more, spreading from below the middle. Male panicle long and narrow, interrupted, the lower bracts like the sheathing scales of the stem, the upper ones and those on the smaller branches very small, passing into the small thinly scarious hyaline glumes which are shorter than the perianths. Flowers as in *L. glauca*, almost clustered and sessile within the glumes without bracteoles. Perianth-segments very thin, pale brown, almost hyaline, all obtuse, the outer ones ovate, about ¾ line long, the inner oblong, 1¼ lines long. Stamens exserted, without any rudimentary ovary. Females unknown.

W. Australia, *Drummond.*

5. RESTIO, Linn.

(Megalotheca, *F. Muell.*)

Flowers diœcious, both sexes several together or the females solitary, in spikelets with imbricate glumes and no bracteoles. Perianth-segments 4, 5 or 6, glume-like or the inner ones almost hyaline, not exceeding the glumes. Male flowers: Stamens 3, filaments filiform, free; anthers 1-celled. Rudimentary ovary small or none. Female flowers: Staminodia 3 or none. Ovary 2- or 3-celled; styles 2 or 3, free from the base or very shortly connate, stigmatic almost from the base. Capsule flat and 2-celled or 3-angled and 3-celled, the cells opening at the angles or very rarely irregularly breaking up on the sides.—Stems simple or branched, leafless except the sheathing scales which are usually persistent. Male and female inflorescences similar or very different, the male spikelets either pedicellate and paniculate or sessile along the branches, the females often more sessile, solitary, clustered or spicate, but sometimes paniculate like the males. The young plants of the first year in several species have two or three of the sheaths at the base of the stem produced into short linear leaves.

The genus is very largely represented in South Africa, without however a single species identical with the Australian ones which are all endemic. Among those here described there are still several in which either the sexes may have been mismatched or one sex as yet unknown and are therefore somewhat uncertain.

Sect. I. **Choristogynia.**—*Male spikelets several flowered; females* 1-*flowered. Stems much branched. Male spikelets sessile along the branches; females terminal or pedunculate.*

- Male flowering branches numerous, erect, slender. Spikelets linear. Capsule very small . . . . 1. *R. fastigiatus.*
- Male flowering branches elongated. Spikelets ovate distant almost from the base . . . . 6. *R. dimorphus.*
- Male spikelets oblong or almost ovoid. Capsule 2 lines diameter . . . . 2. *R. megalotheca.*

SECT. II. **Stachygynia.**—*Both male and female spikelets several flowered* (*in some species however the females unknown*).

- Spikelets (in both sexes ?) small and numerous in a dense terminal panicle.
  - Spikelets ovoid, very shining, with fine-pointed glumes. Tropical species . . . . 3. *R. tropicus.*
  - Spikelets nearly globular, dull brown, obtuse. Western species . . . . 4. *R. applanatus.*
- Spikelets (in both sexes ?) terminating branches or rigid peduncles or sessile along the branches.
  - Sheathing scales loose and spreading, obtuse. Eastern species.
    - Stems rigid and glabrous. Spikelets solitary or few . . . . 5. *R. monocephalus.*
    - Stems slender, glabrous. Spikelets numerous . 6. *R. dimorphus.*
  - Sheathing scales acuminate, loose or erect. Western species.
    - Stems tomentose-villous. Sheathing scales loose. Spikelets numerous . . . . 7. *R. confertospicatus.*
    - Stems glabrous, rigid, under 1 ft. often flexuose.
      - Spikelets solitary or few, ovoid, about 3 lines long . . . . 8. *R. sphacelatus.*
      - Spikelets several, ovoid, about 4 lines long. Glumes with fine points . . . . 9. *R. deformis.*
      - Spikelets several, ovate, 2 lines long, the females longer and narrow . . . . 10. *R. crispatus.*
      - Spikelets numerous, small, globular . . . . 11. *R. nitens.*
    - Stems glabrous, slender, above 1 ft. erect. Spikelets small.
      - Rhizome glabrous. Male spikelets narrow-ovoid, about 3 lines long . . . . 12. *R. gracilior.*
      - Rhizome white-woolly. Scales rather loose. Spikelets narrow, the males about 2 lines, the females 3 to 4 lines long . . . . . . 13. *R. chaunocoleus.*
- Spikelets in both sexes nearly similar, mostly erect and shortly pedicellate, on a simple rhachis or in a narrow interrupted panicle.
  - Sheathing scales obtuse and erect. Eastern species.
    - Stems simple, terete.
      - Spikelets few, at least 4 lines long. Upper sheathing scales loose . . . . 14. *R. australis.*
      - Spikelets numerous, 2 to 3½ lines long. Sheathing scales all closely appressed . . . . 15. *R. gracilis.*
    - Stems very flat . . . . 16. *R. complanatus.*
    - Stems terete, tall, with dense clusters of fine barren branches. Spikelets numerous . . . 17. *R. tetraphyllus.*
  - Sheathing scales spreading, obtuse. Western species 18. *R. laxus.*
- Male spikelets suspended on filiform pedicels. Females sessile. Western species.
  - Sheathing scales loose, dilated and spreading upwards. Quite glabrous . . . . 18. *R. laxus.*

Stems cottony-villous. Sheathing scales ciliate with white hairs . . . . 19. *R. ornatus.*
Sheathing scales erect, appressed.
Stems slender, terete. Sheathing scales acuminate or aristate . . . . 20. *R. leptocarpoides.*
Stems terete. Sheathing scales obtuse . . . . . 21. *R. amblycoleus.*
Stems flat. Spikelets almost globular . . . . . 22. *R. tremulus.*

R. abortivus, Nees in Pl. Preiss. ii. 60, described from a male specimen of Preiss's from Cape Riche, is unknown to me and the genus must remain uncertain. *R. curvulus*, Nees in Ann. Nat. Hist. ser. i. vi. 50, described from a Swan River male specimen of Drummond's first collection, is without doubt one of the species of *Restio* or *Leptocarpus* here included, but the character given is insufficient for identification.

SECTION I. CHORISTOGYNIA.—Stems much branched. Male spikelets several-flowered, sessile along the branches. Female spikelets 1-flowered, terminating the branches or peduncles, or few sessile along the branches.

1. **R. fastigiatus**, *R. Br. Prod.* 246.—Rhizome creeping, woolly-hairy. Stems erect, slender, from 1 to above 2 ft. high, divided in the upper part into numerous erect slender flowering branches. Sheathing scales closely appressed; lower flowering bracts nearly as long as the spikelets. Spikelets numerous, terminal or sessile along the branches or sometimes all pedunculate in the females, very narrow, about 2 lines long. Glumes obtuse or shortly mucronate, often ciliate, especially the outer empty ones. Male flowers several in the spikelet. Perianth-segments 6, narrow, nearly equal. Stamens 3. Female spikelet resembling the male except that the glumes are more mucronate and empty, with a single terminal flower. Perianth-segments as in the males all linear and rigid, but the 3 inner ones broader, more closely imbricate, enveloping each other and the ovary. No staminodia. Ovary 2-celled, the style elongated with rather short stigmatic branches.—F. Muell. Fragm. viii. 67; *R. lateriflorus*, Nees in Sieb. Pl. Exs. n. 42, not of R. Br. and erroneously referred by Spreng. Syst. Cur. Post. 26 to *R. tropicus*; *Calorophus Sieberianus*, Steud. Syn. Glum. ii. 265.

N. S. Wales. Port Jackson, *R. Brown*, and many others.

The female specimens are very rare in collections, some gathered by C. Moore have the habit and inflorescence of the males, in others gathered by Armstrong the spikelets are all solitary and terminal or on long peduncles. In all the females I have examined the spikelets are 1-flowered, although the glumes are nearly as numerous as in the males.

2. **R. megalotheca**, *F. Muell. Fragm.* viii. 99.—Stems erect, branching, 1 to 2 ft. high, terete or nearly so, usually slightly canescent and striate. Sheathing scales closely appressed, obtuse or with a short fine point. Male spikelets terminal or sessile along the small branches of a loose panicle, several-flowered, narrow-ovate and about 1½ lines long in some specimens, broader and 2 lines long in others. Glumes dark brown, the outer empty ones short broad with rather long points, the flowering ones gradually narrower with shorter points. Perianth-segments 6, linear, the 2 outer ones complicate, the others flat. Female

spikelets terminal, with rarely a sessile one lower down, about 4 lines long. Glumes not numerous, broad, 2 or 3 outer ones much shorter and obtuse, the next acuminate. Flower solitary and terminal Perianth-segments 4 to 6? broad and thin, the outer not much shorter than the glume, the inner gradually much shorter and sometimes very small. Ovary 2-celled; style as in *R. fastigiata* elongated, rather thick, with 2 stigmatic branches rather shorter than the entire part. Capsule broad, thick and hard, fully 2 lines diameter, opening at the angles.—*Megalotheca striata*, F. Muell. l. c.

W. Australia. *Drummond*, 1*st coll. and n.* 950; also *suppl. n.* 103 and *n.* 186.—Masters only found 4 perianth-segments in the female flower of the specimen he examined; in the one I examined there appeared to be 2 outer and 3 inner ones, but the specimens are in fruit and the remains of the perianth much broken.

SECTION II. STACHYGYNIA. Stems various. Female spikelets, where known, containing several flowers as well as the males.

3. **R? tropicus,** *R. Br. Prod.* 246.—Rhizome not seen. Stems stout, undivided, above 2 ft. high. Sheathing scales closely appressed, acute. Male spikelets very numerous in a much branched thyrsoid or pyramidal panicle of 4 to 6 in., nearly sessile along the almost filiform branches, all of a rather light shining brown, about 2 lines long. Glumes almost scarious, broadly lanceolate, tapering to a fine point, 1 or 2 outer ones shorter and empty. Perianth segments 5, 2 outer ones narrow, acuminate, complicate, 3 inner ones shorter broader hyaline and almost obtuse. Female plant unknown.

N. Australia. Gulf of Carpentaria, *R. Brown.*

The female plant being unknown the genus of this species must remain uncertain, it may very possibly be a *Leptocarpus*, the male inflorescence is however very different from that of any other species of either genus.

4. **R. applanatus,** *Spreng. Syst.* i. 185.—Rhizome very densely tufted, shortly horizontal in the specimens seen. Stems simple, rigid, slender, slightly compressed, 2 ft. high or more. Sheathing scales closely appressed, mostly obtuse; the floral bracts small and short. Male spikelets numerous in a short terminal panicle, the short but very unequal branches clustered within the bracts and more or less divided. Perianth-segments 5 or 6, narrow. Female panicle more crowded than the male, the spikelets nearly globular, dark brown, about 1½ lines diameter. Glumes ovate, obtuse. Flowers not very numerous, the lower ones often reduced to empty perianths and the lowest glumes quite empty. Perianth glabrous or slightly ciliate. Ovary usually 3-celled. Styles free almost from the base, long and involute. Staminodia 3. Capsule normal.—F. Muell. Fragm. viii. 69; *R. compressus*, R. Br. Prod. 245, not of Rottb.

W. Australia. King George's Sound, *R. Brown*, also in *Drummond's* collection, the number illegible but more like 104 than 707.

Sprengel's name, selected without having seen the plant, is very inappropriate, for the stem though compressed is not flat.

5. **R. monocephalus,** *R. Br. Prod.* 245.—Rhizome creeping, woolly-hairy. Stems in the typical form simple or with a few flowering branches in the upper part, about 6 in. high, each stem or branch terminating in a single or rarely 2 spikelets, but a few specimens show a variety or luxuriant state attaining 1 ft. with several even as many as 25 spikelets in a narrow panicle. Sheathing scales short, loosely obovate or oblong, obtuse, spreading upwards. Spikelets dark-coloured, from broadly ovate to almost oblong, about 3 lines long, the males usually narrower than the females. Glumes oblong, obtuse, often loosely hairy outside as well as the perianths. Perianth-segments in both sexes usually 6, narrow, rather obtuse. Stamens exserted. Staminodia in the females very unequal and variable. Ovary 2-celled; styles at first connate at the base at length free or nearly so. Capsule opening at the edges.—Hook. f. Fl. Tasm. ii. 70. t. 135; *R. oligocephalus*, F. Muell. Fragm. viii. 68.

Tasmania. Derwent River, *R. Brown*; not uncommon in various parts of the Colony, *J. D. Hooker*, and others. A specimen of Labillardière's in herb. DC. is also probably from Tasmania.

6. **R. dimorphus,** *R. Br. Prod.* 246.—Rhizome creeping, but the woolly hairs not abundant. Stems slender, 1 to 2 ft. long, divided into weak branches all floriferous, often from near the base. Sheathing scales rather broad, loose and open almost from the base, spreading upwards, obtuse and glabrous; floral bracts shorter than the spikelets. Male spikelets numerous, ovate, sessile or nearly so within the bract, distant along the branches or terminal, about 2 lines long. Glumes obovate or oblong, acuminate with a rather short point, not at all or scarcely ciliate, several outer ones empty. Perianth-segments 6. Filaments shortly callous at the base but no rudiment of the ovary. Female plant: Spikelets fewer and more distant, all sessile and 1-flowered in the specimens examined but with several empty glumes. inner glumes acuminate, $1\frac{1}{2}$ lines long, with rather long points. Perianth-segments 5 (or 6?), oblong, obtuse, nearly equal. Ovary in the specimens examined 2-celled, or according to Brown 3-celled. Styles united at the base. Capsule hard, broad, opening at the sides and frequently 1-celled by abortion and then very oblique.—F. Muell. Fragm. viii. 68.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 40 *and* 44, *C. Moore* and others.

Queensland? The specimens from Moreton Island referred by F. Mueller to this species have similar slender stems and open sheaths, but the branches terminate in single male spikelets much longer than in the ordinary *R. dimorphus*. They are however in a very imperfect state.

7. **R? confertospicatus,** *Steud. Syn. Glum.* ii. 256.—Rhizome densely tufted, scarcely creeping. Stems erect, simple or with short flowering branches clustered in the bracts, from under 1 ft. to about $1\frac{1}{2}$ ft. high, tomentose and shortly villous or at length glabrous. Sheathing scales loose and open from the base, spreading upwards, obtuse with or without a small point, usually cottony-ciliate on the margin. Floral bracts broad, all except the lowest shorter than the

spikelets. Male inflorescence commencing from below the middle of the stem. Spikelets sessile in dense tufts or heads of 3 to 8 or 10 or rarely solitary, the heads either all sessile and distant, or here and there a pedunculate head issuing from the same bract, or in other specimens several peduncles or branches clustered with the sessile head, each bearing 1 to 4 heads or solitary spikelets, each spikelet narrow-ovate, 2½ to 3 lines long. Glumes narrow-ovate, ciliate at the end, with a rigid point or short awn, 3 or 4 lower glumes empty. Perianth-segments 5 or 6, all narrow, the inner ones very thin. No rudimentary ovary. Females unknown.

W. Australia, *Drummond, n.* 341 ; sand plains, Upper Kalgan River, *F. Mueller.* The species appears in many respects allied to *R. dimorphus.*

8. **R.? sphacelatus,** *R. Br. Prod.* 246.—Stems erect with flexuose branches, terete or very slightly compressed, rigid, glabrous, 6 to 8 in. high. Sheathing scales appressed, slightly ciliate, rounded at the end, with a small point. Male spikelets all terminal, ovate, dark-coloured, scarcely 3 lines long. Glumes ovate, obtuse or with very short points, 2 or 3 outer ones empty. Perianth very flat, segments 5 in the flowers examined, 6 according to R. Brown, 2 outer ones linear complicate, 3 inner lanceolate and flat. Filaments rather long. Rudimentary ovary minute. Females unknown.

W. Australia. Lucky Bay, *R. Brown.* Apparently allied to *R. deformis.*

9. **R. deformis,** *R. Br. Prod.* 245.—Rhizome creeping, the white woolly hairs copious, but sometimes wearing off. Stems under 1 ft. high, terete, erect and simple or with few flexuose branches, quite glabrous. Sheathing scales appressed, dark brown, tapering to a short fine point. Floral bracts broad and acuminate but closely embracing the base of the spikelet or short peduncle. Male spikelets ovoid, dark-coloured, about 4 lines long, terminating the branches and usually 1, 2 or more sessile or shortly pedunculate lower down. Glumes rather broad, acuminate with rigid points very short on the inner glumes rather long on the outer ones, the lowest empty glumes short. Perianth-segments 5, slightly ciliate, 2 outer ones narrow, complicate, 3 inner flat and narrow-lanceolate. Rudiment of the ovary minute. Female inflorescence similar, but the spikelets rather smaller, with several flowers. Perianth-segments not ciliate. Ovary 2-celled. Style 2-cleft. Capsule 2-celled and regular, or 1-celled by abortion and oblique.

W. Australia. Lucky Bay, *R. Brown;* also *Drummond, n.* 96.

10. **R. crispatus,** *R. Br. Prod.* 246.—Very near *R. deformis*, but taller and more slender, the short flexuose flowering branches numerous, giving it almost the aspect of a *Caustis*, the rhizome glabrous or nearly so, with several barren flexuose branching stems. Sheathing bracts and inflorescence of *R. deformis.* Male spikelets ovate, about 2 lines

long. Perianth-segments narrow. Glumes with short rigid points. Female spikelets about 3 lines long, narrow. Glumes acuminate. Flowers 2 in the spikelet examined. Perianth-segments 6. Capsule of the lower flower 1-celled by abortion, very oblique, the style bipartite, in the upper flower 2-celled and regular.

W. Australia. Lucky Bay, *R. Brown.*

11. **R.? nitens,** *Nees in Pl. Preiss.* ii. 59.—Rhizome creeping, with very little wool, the imbricate scales on the rhizome and base of the stem very rigid and shining brown. Stems under 1 ft. high, paniculate and flexuose almost from the base, quite glabrous. Sheathing scales rather loose, obtuse or shortly pointed or one below the branches closely appressed. Spikelets in our specimens numerous, sessile or on short rigid erect peduncles, globular and scarcely 2 lines diameter, apparently female, but all diseased except a few young buds in which I found 6 perianth-segments rather short and broad, 2 outer concave, the others flat, no staminodia, and a 2-celled ovary terminating in 2 short points; in all the other heads both in Drummond's and in Preiss's specimens the ovaries are converted into ovoid acute utricles filled with black granules (*Uredo Restionis,* Nees).

W. Australia. Swan River, *Drummond,* 1*st coll., Preiss, n.* 1696, perhaps all the specimens from the same gathering, as Preiss and Drummond were for some time together.

12. **R.? gracilior,** *F. Muell. Herb.*—Rhizome creeping, with very little wool. Stems slender, 1 to 2 ft. high, erect with several erect branches, quite glabrous, sulcate-striate. Sheathing scales narrow, closely appressed, obtuse. Male spikelets rather numerous, terminal and sessile along the slender branches of a loose panicle, all erect, shining brown, ovate or oblong, about 3 lines long. Glumes lanceolate, acutely acuminate. Perianth-segments 6, all narrow, 2 outer ones concave, the third and the 3 inner ones flat. Anthers shortly exserted. Females unknown.

W. Australia, *Drummond, n.* 68 and 71. The habit is nearly that of the eastern *R. gracilis.*

13. **R. chaunocoleus,** *F. Muell. Fragm.* viii. 61.—Rhizome thick, shortly creeping, densely covered with a whitish wool not concealed by scales. Stems erect, simple, slender but rigid, terete, glabrous, often above 2 ft. high. Sheathing scales narrow but loose above the middle, acute and often produced into a fine point. Male spikelets numerous, in a terminal interrupted spike, either simple or with short erect branches, all sessile and erect or with a pedunculate one in the same bract, each spikelet about 2 lines long, containing but few flowers. Glumes ovate-lanceolate with a fine point very short on the inner ones, 2 or 3 outer glumes empty. Perianth-segments 5 or 6, 2 or 3 outer ones very narrow-linear, rigid, concave or complicate, 3 inner linear-lanceolate flat and very thin. Female spikelets much fewer, narrow,

4 to 5 lines long, containing usually only 2 or 3 flowers, with several empty glumes. Perianth often 2 lines long, the 2 outer segments complicate with the dorsal keel dilated upwards into a scarious jagged or ciliate wing as in *Leptocarpus tenax*, 3 inner segments lanceolate flat and thin. Staminodia 3. Ovary broad flat, retuse, 2-celled; styles united at the base, stigmatic in the upper half only. Capsule flat, thick, emarginate, about 1½ lines long and broad, opening at the edges.

W. Australia, *Drummond* 1st *coll. and n.* 948 (♂) *and* 949 (♀).

14. **R. australis,** *R. Br. Prod.* 245.—Rhizome creeping, woolly-hairy. Stems erect, undivided, 1 to 2 ft. high or rarely more. Lower sheathing scales closely appressed, about ½ in. long, the upper ones longer and looser, all obtuse; floral bracts broader looser and rather acute, the lower ones sometimes 1 in. long, the upper ones much shorter. Spikelets in both sexes few at the end of the stem, solitary and sessile or nearly so within the bracts, or 2 within the lower bract one on a short pedicel; all ovoid, 4 or 5 lines long. Glumes lanceolate, acuminate with a fine point, rather spreading. Male flowers: Perianth about 1 line long, 2 outer segments narrow, complicate, the third flat or sometimes deficient, 3 inner ones flat but narrow, obtuse. Stamens shortly exserted. Female spikelets usually rather longer than the male. Perianth-segments 4 or 6. Staminodia 2 or 3. Ovary 2-celled. Capsule opening on the edges.—F. Muell. Fragm. viii. 69; Hook. f. Fl. Tasm. ii. 71.

N. S. Wales. Port Jackson, *Sieber*, *n.* 33.
Victoria. Cobberas Mountains, *F. Mueller.*
Tasmania. Derwent River, *R. Brown*; abundant on the mountains in marshy places, *J. D. Hooker* and others.

15. **R. gracilis,** *R. Br. Prod.* 245.—Very nearly allied to *R. australis*; differing chiefly in the more slender stems, the sheathing scales more closely appressed and the more numerous smaller spikelets forming an interrupted more or less compound spike or narrow panicle of 2 to 4 in. Floral bracts acuminate with a fine point. Male spikelets rather broad, varying from 2½ to 3½ lines long, nearly sessile or almost all on pedicels as long as or longer than the bracts. Perianth-segments 6, the 2 outer ones complicate as in *R. australis*. Female spikelets longer and more sessile, very narrow in Brown's specimens, broader in others. Flowers 2-merous as in *R. australis* but no staminodia.—F. Muell. Fragm. viii. 69; *R. pallens*, R. Br. Prod. 245.

Queensland. Moreton Island, *F. Mueller*; Brisbane, *Prentice.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *F. Mueller* and others; New England, *C. Stuart*; Tweed River, *Guilfoyle*; Richmond River, *Mrs. Hodgkinson.*
Tasmania. Recherche Bay, *C. Stuart.*

The majority of our male specimens, especially those with the smaller heads, correspond with Brown's of *R. pallens* which are all males. Brown's specimens of *R. gracilis* are all females, with rather long narrow spikelets. Our female specimens are very few, with shorter and more crowded spikelets than in Brown's, but they are either more advanced or in an imperfect state.

16. **R. complanatus,** *R. Br. Prod.* 245.—Rhizome short and thick with little or no wool. Stems densely tufted, erect, simple, much flattened. Sheathing scales appressed, obtuse, rather thin, ½ to ¾ in. long. Male spikelets rather numerous, in a narrow panicle, on filiform pedicels, narrow-ovate, scarcely 3 lines long. Glumes shortly acuminate, slightly ciliate, the midrib produced into a fine point, one or two outer ones short and empty. Perianth often shortly stipitate within the glume, segments 4, narrow. Stamens 2. Female spikelets usually fewer and narrower than the males and sometimes longer, the glumes rather distant. Ovary sessile, 2-merous. Capsule scarcely dehiscent.—Hook. f. Fl. Tasm. ii. 71; F. Muell. Fragm. viii. 67.

Queensland. Brisbane River, *Bailey.*

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 8 and many others; northward to Hastings River, *Beckler;* southward to Twofold Bay, *F. Mueller.*

Victoria. Lawrence River, *Robertson;* Mount Abrupt and Grampians, *F. Mueller;* Mount William, *Sullivan.*

Tasmania. Derwent River, *R. Brown;* about Circular Head and George Town, *Gunn;* Southport, *C. Stuart.*

17. **R. tetraphyllus,** *Labill. Pl. Nov. Holl.* ii. 77. *t.* 226, 227. Rhizome thick, densely woolly-hairy under the short broad scales. Stems erect, 2 or 3 ft. high, usually bearing filiform dichotomous branches, either short and dense or longer and loose, clustered within the erect appressed sheathing scales. Spikelets in both sexes usually rather numerous, pedicellate in a narrow loose panicle. Male spikelets from narrow ovate to nearly globular, 2 to 3 lines long. Glumes acuminate, with short fine points. Perianth-segments 6, 2 outer rather broad and complicate, the third narrow, 3 inner flat and hyaline, 1 broad and 2 narrow. Female spikelets usually longer and narrower, the glumes more acuminate. Perianth-segments 4, 2 outer ones complicate and lanceolate, 2 inner broader and flat but with the margins folded in. Capsule small, flat, not usually opening at the margins but the thin sides bursting irregularly.—R. Br. Prod. 247; Hook. f. Fl. Tasm. ii. 71; F. Muell. Fragm. viii. 66.

Queensland. Brisbane River, *Leichhardt*, *Bailey;* Wide Bay, *Sheridan;* Rockhampton, *Thozet.*

N. S. Wales. Port Jackson, *R. Brown*, *Sieber n.* 34 and others; northward to Clarence and Hastings Rivers, *Beckler*, *Wilcox;* New England, *C. Stuart;* Richmond River, *Mrs. Hodgkinson.*

Victoria. Portland, *Allitt;* Tarwin River, Gipps' Land, *F. Mueller.*

Tasmania, *Labillardière;* Huon River, *R. Brown;* abundant throughout the island forming large tufts, *J. D. Hooker.*

There appear to be two varieties both among the N. S. Wales and the southern specimens, one with large ovate the other with small nearly globular spikelets. According to F. Mueller the capsules in the latter variety open at the edges, but I have not myself succeeded in finding any such.

18. **R. laxus,** *R. Br. Prod.* 245 (*n.* 3).—Rhizome creeping. Stems rather slender, terete, erect or flexuose, simple or slightly branched. Sheathing scales loose, dilated and spreading above the middle, very obtuse and quite glabrous. Spikelets few, sometimes only 1 or 2, the

males shortly pedicellate, the females more sessile, ovate, of a bright brown, 4 to 5 lines long. Glumes acute with a fine point, one or two outer ones in the males, several in the females empty. Perianth-segments 5 or 6, narrow, thin, mostly acuminate. Ovary 2-merous in the spikelet examined by F. Mueller, 3-merous according to R. Brown. —*R. chasmatocoleus,* F. Muell. Fragm. viii. 71.

W. Australia. King George's Sound and Lucky Bay, *R. Brown;* Toovey, *Maxwell;* Tone River, *Oldfield.*

I have only been able very imperfectly to examine the female spikelets, but on comparison F. Mueller's and R. Brown's species are evidently identical.

19. **R. ornatus,** *Steud. Syn. Glum.* ii. 256.—Rhizome slender, creeping. Stems slender, erect or slightly flexuose, mostly about 1 ft. high or rather more, simple or with few erect branches, or occasionally clusters of short sterile compound branchlets from the lower sheaths. Sheathing scales spreading from near the base, very obtuse, bordered by long white woolly hairs, and the lower part of the stem with loose cottony hairs at length wearing off. Spikelets few; males broadly ovate, 3 to 4 lines long, pendulous on short filiform pedicels. Glumes ovate or ovate-lanceolate, striate, with fine rigid points. Perianth-segments 6, narrow, acute but not acuminate. Female spikelets much narrower and erect, the flowers fewer, the glumes similarly awned. Perianth the same. Staminodia 3. Ovary 2-celled or very rarely 3-celled. Capsule hard, about 1 line broad, opening at the angles.—*R. confinis,* Steud. l. c.; *R. Steudelii,* F. Muell. Fragm. viii. 70.

W. Australia, *Drummond, n.* 339 (♂) *and* 324 *and* 340 (♀).

20. **R. leptocarpoides,** *Benth.*—Rhizome densely tufted, scarcely creeping, woolly with reddish brown hairs. Stems slender, erect or flexuose, 1 to 1½ ft. high in the typical form, simple or sparingly branched. Sheathing scales narrow, erect, appressed, tapering into a fine erect point. Male plant: Floral bracts narrow, erect and acuminate like the stem-scales. Spikelets 6 to 12, spreading or pendulous on unequal clustered filiform pedicels, of a shining brown, 4 to 5 lines long. Glumes lanceolate, very acute, not closely imbricate, above 2 lines long, 1 or rarely 2 at the base empty. Perianth-segments 5, 2 outer ones very narrow concave and very acute, 3 inner rather broader, flat, hyaline and less acute. Filaments very short. Female floral bracts broader and more open. Spikelets few, erect, sessile or on short rigid erect pedicels, ovoid, 3 to 4 lines long. Glumes broad, rigid, with short points. Perianth-segments 5, 2 outer ones rather broad, acute, complicate with a prominent woolly-ciliate dorsal keel often slightly winged, 3 inner flat, lanceolate, hyaline, scarcely acute. Staminodia 3. Ovary flat, 2-celled. Styles connate at the base. Capsule broad, emarginate, opening at the edges. —*R. deformis,* Nees in herb. Lindl.; F. Muell. Fragm. viii. 65, not of R. Br.

W. Australia. King George's Sound, *Collie,* Kalgan River, *Oldfield;* Busselton, *Preiss;* Swan River, *Drummond* 1st *coll. and n.* 907, also 188, 381 (♂) and 369 (♀).

The inflorescence and general habit nearly resemble those of *Leptocarpus aristatus*, but the female flowers are very different.

Var.? *monostachya*, F. Muell. Stature smaller and the female stems always ending in a single spikelet.—Stirling Range, *F. Mueller*.

21. **R. amblycoleus,** *F. Muell. Fragm.* viii. 65.—Rhizome apparently shortly creeping, the woolly hairs not very copious. Stems erect, rigid, terete, simple, 1 to 2 ft. high. Sheathing scales rigid, closely appressed, obtuse. Floral bracts shorter and looser at the end. Male spikelets few in the upper part of the stem, on short slender pedicels, either solitary or 2 or 3 on the lowest peduncle, all narrow-ovate, 4 to 6 lines long. Glumes imbricate, with fine slightly spreading points. Perianth-segments 6, all linear, 2 outer ones concave, the 3rd and 3 inner ones flat. Anthers shortly exserted. Female spikelets about as many as the males, but larger, erect, and sessile or on short rigid pedicels. Glumes rigid with spreading points. Capsules round flat and 2-celled (*F. Mueller*), all fallen away from our specimens.

W. Australia, *Drummond, n.* (66 or 99).

22. **R. tremulus,** *R. Br. Prod.* 245.—Stems flattened, the flowering ones erect, rigid, simple, 2 to 3 ft. high, barren ones short or slender, with flexuose branches. Sheathing scales closely appressed, rigid, striate, the lower ones usually shortly plumose-ciliate at the end, and often bearing a short obtuse erect lamina. Floral bracts short and closely appressed, distant from each other. Male spikelets on capillary pedicels of ½ to 1 in., clustered several together from each bract, all broadly ovate or almost globular, about 3 lines diameter, brown and shining. Glumes ovate or ovate-lanceolate, obtuse or scarcely acute, about 1½ lines long, very numerous with a few smaller outer ones empty. Perianth-segments 6, all narrow and nearly equal. 2 outer ones concave, the others flat. Filaments slender but short. Female inflorescence more compact, the spikelets narrower, all erect, the pedicels rigid and often branched, especially the lower ones, Glumes shortly ciliate. Ovary 2-celled; styles free from the base, long and slender, spirally involute in the bud. Capsule obcordate, rather hard, opening on the edges.—F. Muell. Fragm. viii. 70; *R. brizoides*, Steud. Syn. Glum. ii. 255.

W. Australia. King George's Sound or adjoining districts, *R. Brown*, *Harvey*, *Maxwell* and others; Porongerup, *F. Mueller;* Swan River, *Miss Lukin;* also *Drummond, n.* 342 (♂) and 343 (♀).

6. LEPTOCARPUS, R. Br.

Flowers diœcious, both sexes in spikelets with imbricate glumes without bracteoles, or the females in compound spikelets with bracteoles. Perianth-segments 6 or fewer by abortion, variously shaped. Male flowers: Stamens 3 or rarely 2; filaments filiform, free, usually very short; anthers 1-celled. Rudimentary ovary small or none.

Female flowers: Staminodia 3 or none. Ovary 1-celled, with 1 pendulous ovule; styles 3 (rarely 2?), filiform, free or united to near the middle, the free part stigmatic from near the base. Fruit narrow or ovoid, with a thin pericarp opening on one side, or with a thicker pericarp splitting at the angles. Stems simple or branched, leafless except the sheathing scales which are usually closely appressed and erect. Male and female inflorescences nearly similar or very different, in some species the spikelets of both sexes in narrow panicles, in others the males pedicellate and paniculate, the females sessile and clustered or spicate. Male spikelets always several-flowered with 1, 2 or rarely 3 outer empty glumes. Females various.

The genus like *Restio* is also represented in South Africa, and there is one species in New Zealand, but the Australian ones appear to be all endemic. The males of some species are scarcely to be distinguished from those of some species of *Restio*, but the females are readily recognised.

SECT. I. **Diplanthesis.**—*Male spikelets on filiform pedicels, paniculate or clustered, mostly pendulous. Females sessile, in heads spikes or dense panicles.*

Female spikelets regularly imbricate without bracteoles.
Male spikelets numerous in a terminal panicle.
Female perianth-segments 6, all narrow and acuminate. Spikelets densely paniculate. Glumes with scarious margins . . . . 1. *L. scariosus.*
Female perianth-segments 5, 2 outer ones complicate with a very prominent usually winged keel. Spikelets few or rarely in a dense panicle . . . . . . 2. *L. tenax.*
Female spikelets irregularly compound though dense, with bracteoles under each flower. Male spikelets few or in distant clusters.
Female perianth-segments nearly equal or gradually passing from the outer larger to the inner smaller ones.
Male spikelets few. Females in a compact short spike-like panicle. Eastern species . . . . . 3. *L. Brownii.*
Male spikelets in distant loose clusters. Western species.
Female spikelets small in distant clusters . . . . 4. *L. canus.*
Female spikelets very small along the slender spike-like branches of a narrow panicle . . . . . 5. *L. coangustatus.*
Female perianths of 3 outer long rigid subulate segments and 3 small oblong inner ones closed over the ovary and base of the style. Western species.
Female spikelets in oblong clusters. Perianths ciliate at the base but the hairs not showing outwards . 6. *L. aristatus.*
Female spikelets in dense heads. Perianths woolly-ciliate, the white hairs showing outwards . . . 7. *L. erianthus.*

SECT. II. **Homœanthesis.**—*Spikelets in both sexes very small, clustered along the branches of a long panicle. Tropical species.*

Spikelets very densely clustered along the short branches of a long dense panicle.
Outer female perianth-segments erect, inner short, tomentose, closed over the ovary . . . . 8. *L. ramosus.*
Perianth-segments all equal narrow, glabrous . . . . 9. *L. elatior.*
Spikelets clustered along the few narrow branches of the panicle. Perianth-segments glabrous.

Stem glabrous . . . . 10. *L. spathaceus.*
Stem cottony-villous . . . . 11. *L. Schultzii.*

SECTION I. DIPLANTHESIS.—Male spikelets on filiform pedicels, paniculate or clustered, mostly pendulous. Female spikelets sessile, in heads spikes or dense panicles.

The male plants of this section show no generic character or habit to distinguish them from the males of *Restio leptocarpoides* and allied species. The females are very different.

1. **L. scariosus,** *R. Br. Prod.* 250.—Rhizome thick tufted or creeping. Stems erect, simple or scarcely branched, terete, 2 ft. high or more. Sheathing scales closely appressed, mostly terminating in a short point and in thin hyaline scarious margins or appendages often split or jagged, but sometimes wearing away or disappearing leaving the sheath truncate; floral bracts also narrow but more acute. Male spikelets several, often very numerous, on short but filiform pedicels in a loose terminal panicle, all of a shining brown, rather narrow and nearly 3 lines long when fully out. Glumes about 1 line long, acuminate with a fine point, and often bordered by narrow scarious margins. Perianth-segments 5 (or 6?), the 2 outer ones narrow, concave, tapering to a fine point, the inner ones also fine pointed but broader flat and more hyaline. Female panicle often as large as the male but much more dense, the spikelets broader and almost sessile. Glumes, nearly 2 lines long, ovate-lanceolate, acuminate with fine points, and usually with rather broad white scarious hyaline margins, giving the panicle a variegated appearance. Rhachis of the spikelets ciliate with long hairs. Perianth-segments 6, all narrow, acute, almost hyaline and equal. Styles capillary (or short, *F. Muell.*).—F. Muell. Fragm. viii. 94; *Schœnodum scariosum*, Kunth, Enum. iii. 447.

W. Australia. King George's Sound, *R. Brown*, *Milne*, *F. Mueller* and others, and thence to Swan River, *Drummond*, 1*st coll. and n.* 945 (♂) and 944 (♀), *Oldfield.*

R. Brown described this species like the *L. tenax* and *L. aristatus* from the female specimens only, having failed to match them with their corresponding males, so very different in inflorescence that in all three cases he described them as *Restios*. Relying, however on the concurrent testimony of modern collectors, the plant sent as the male of *L. scariosus* would include *Restio cinerasceas*, R. Br. Prod. 246, from King George's Sound. *R. setuligerus*, Nees in Pl. Preiss. ii. 58 (*Leptocarpus setuligerus*, F. Muell. Fragm. viii. 97) appears to me to be only a more luxuriant state of the same male with rather more numerous smaller spikelets. Some female specimens from Swan River, *Drummond*, differ slightly in their narrow spike-like panicles more scarious pale glumes and a less hairy rhachis, the rhizome is also more creeping. The variety from the Vasse River, *Pries*, mentioned by F. Mueller, Fragm. viii. 94, has large male spikelets with very broad scarious margins to the glumes and the perianth-segments are large and hyaline, but belongs most probably to the same species.

2. **L. tenax,** *R. Br. Prod.* 250.—Rhizome creeping. Stems 1½ to 3 ft. high, slender especially the males, undivided, the whole plant glabrous except sometimes a slight tomentum on the rhachis of the

inflorescence. Sheathing scales closely appressed, under ½ in. long; floral bract under the panicle similar, the others shorter and more open. Male spikelets very numerous, in a loose panicle of 2 to 4 in., all pedicellate, ovate-oblong, about 2 lines long, of a dark brown. Glumes ovate, obtuse or with a very short point. Perianth-segments obtuse or scarcely acute, very thin, nearly equal, or 2 outer ones narrower and more pointed. Filaments very short, the anthers affixed near the base. Female spikelets few, sessile or shortly pedicellate, erect, of a rich brown, nearly cylindrical, often nearly ½ in. long, several-flowered. Glumes acutely acuminate, a few outer empty ones shorter and thin. Perianth much flattened, 2 outer segments broad, acute, complicate, the dorsal keel dilated into a wing, 3 inner ones narrow, all acute. Styles shortly connate at the base. Pericarp thin.—Hook. f. Fl. Tasm. ii. 73; F. Muell. Fragm. viii. 93; *Schœnodum tenax*, Labill. Pl. Nov. Holl. ii. 80, t. 229 as to the female plant; *Restio microstachys*, R. Br. Prod. 246, Nees in Pl. Preiss. ii. 59 (♂); *R. laxus*, n. 12, R. Br. Prod, 246; *R. diffusus*, Spreng. Syst. i. 185; *R. cinerascens*, Nees in Sieb. Pl. Exs. 41 (♂); *R. gracilis* and *R. pallens*, Nees in Sieb. Agrost. n. 47, 48 (♀) not of R. Br.; *Leptocarpus thamnocortoides*, F. Muell. Fragm. viii. 96.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, and many others; northward to Newcastle, *Leichhardt;* southward to Twofold Bay, *F. Mueller*.

Victoria. Common in heaths, Wendu Vale, *Robertson;* thence to Gipps' Land, *F. Mueller;* Mount William, *Sullivan*.

Tasmania. Derwent River, *R. Brown;* waste places throughout the island, abundant, *J. D. Hooker* and others.

W. Australia. King George's Sound, *R. Brown*, and adjoining districts, *Preiss, n.* 1709, *Drummond, n.* 107, 391, *Oldfield*, *F. Mueller* and others; Blackwood River, *Forrest;* Swan River, *Miss Lakin*. Some of these western specimens are precisely like the eastern ones, the females with few spikelets about ½ in. long, others have the female spikelets only 3 or 4 lines long, and rather numerous in a dense narrow panicle of about 3 in., with many intermediate states. Brown described the plant from female specimens only from his three stations and failed to recognise the male plant. Labillardière mistook for the male that of *Lyginia barbata*.

3. **L. Brownii,** *Hook. f. Fl. Tasm.* ii. 73, t. 136.—Rhizome creeping. Stems erect or flexuose, simple, rather slender, from under 1 ft. to above 2 ft. high. Sheathing scales closely appressed, short and truncate. Male spikelets on short filiform pedicels, not numerous, of a rich brown, attaining about 6 lines in length but often much shorter. Glumes loosely imbricate, acutely acuminate, nearly 2 lines long. Perianth-segments 6, 2 outer ones linear, concave, acute, 1 or 2 inner ones rather broad and flat very thin and denticulate, the others intermediate. Filaments short. Female inflorescence very compound and compact, crowded into a short spike-like panicle, sometimes 1½ in. long and interrupted at the base, sometimes reduced to a terminal head. Spikelets of 3 to 6 flowers (or 3 to 6 1-flowered spikelets) on a short common axis, but each flower within 1 or 2 bracteoles besides the subtending glume and the perianth; the floral bracts, glumes, bracteoles and perianth-segments all ovate, acutely acuminate and closely enveloping

each other, passing gradually from the very pointed floral bracts and lower glumes of 2 lines to the broad scarcely pointed inner perianth-segments of under 1 line. Style-branches 3.—F. Muell. Fragm. viii. 91; *L. simplex*, R. Br. Prod. 250 (excl. syn. Forst. and Willd.); Nees in Pl. Preiss. ii. 63; *Schœnodum simplex*, Kunth, Enum. iii. 446 as to syn. R. Br., but not the N. Zealand plant described.

Victoria. From Port Phillip to Snowy River, Gipps' Land, *F. Mueller*; Wimmera, *Dallachy*.

Tasmania. Derwent River, *R. Brown*; abundant in wet marshy places throughout the island, *J. D. Hooker*.

S. Australia. Guichen and Rivoli Bays, St. Vincent's Gulf, *F. Mueller*; Port Lincoln, *Brown*; Boston Point, *Wilhelmi*.

4. **L. canus**, *Nees. in Ann. Nat. Hist. ser.* 1. vi. 50, *and in Pl. Preiss.* ii. 64.—Rhizome woolly, knotted and horizontal or creeping. Stems slender, erect, simple or with a few long erect branches, 1 to 3 ft. high. Sheathing scales closely appressed. Spikelets clustered in the axils of distant sheathing bracts. Males on short filiform pedicels, ovate or oblong, of a shining brown, 2 to 3 lines long. Glumes ovate, acute, not closely imbricate and spreading when in flower, about 1 line long, with narrow scarious margins. Perianth-segments hyaline, usually narrow acute and shorter than the anthers, but sometimes 1 or 2 longer. Filaments very short. Female spikelets nearly sessile, 2 or 3 in the cluster, $1\frac{1}{2}$ to 3 lines long, but each spikelet compound as in L. *Brownii*, each flower being within 2 or 3 bracteoles besides the short subtending glume, the rhachis ciliate. Perianth-segments 6, nearly equal, linear or linear-lanceolate, scarcely $\frac{3}{4}$ line long, closely appressed to the ovary and fruit, the densely ciliate margins giving the flower a whitish appearance. Style-branches 3. Nut small, brown, 1-seeded as in the rest of the genus, but the pericarp readily splitting into 3 valves.—F. Muell. Fragm. viii. 95; *L. ciliaris*, Nees in Pl. Preiss. ii. 64, as to the male plant.

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 946 (♂) *and* 947 (♀); *Preiss. n.* 1712 (♂) *and* (1705) (♀); Gordon River, *Oldfield*; Upper Hay River, *Miss Warburton*.

5. **L. coangustatus**, *Nees in Pl. Preiss.* ii. 65.—Rhizome creeping. Stem erect, rather slender, usually divided into a few long erect branches, 1 to 3 ft. high. Sheathing scales closely appressed, mucronate, those under the branches looser. Male spikelets resembling those of *L. canus*, of a shining brown, on very short pedicels and irregularly clustered, but the clusters more branching less distant and forming more of a panicle, each spikelet 3 to 4 lines long. Glumes not closely imbricate, tapering into long fine points. Perianth-segments thin and unequal. Female spikelets small, numerous, irregularly compound, in narrow spike-like panicles of 1 to 3 in., several of these spikes usually forming a long narrow loose panicle of 6 in. to 1 ft. Flowers in the spikelet numerous on a ciliate hairy rhachis, 1 or 2 outer glumes brown acuminate and glabrous, the inner ones gradually smaller

and narrower, passing irregularly into bracteoles and perianth-segments. Styles 3, distinct.—F. Muell. Fragm. viii. 94.

W. Australia. Various localities from King George's Sound to Swan River. *Drummond, Preiss. n.* 1706, *Oldfield, Muir, Pries* and others. Some of the larger specimens have almost the aspect of *Lepyrodia glauca.*

6. **L. aristatus,** *R. Br. Prod.* 250.—Rhizome tufted, scarcely creeping, glabrous or nearly so. Stems slender, erect, simple, about 1 ft. high, accompanied sometimes by a few short flexuose-branched barren stems. Sheathing scales closely appressed, acute or with minute points, under ½ in. long. Male spikelets closely resembling those of *Restio leptocarpoides*, 3 to 4 lines long, on filiform clustered pedicels, spreading or pendulous. Glumes slightly spreading, acutely acuminate, almost aristate. Perianth reduced to small thin spathulate segments or sometimes entirely deficient. Filaments short. Female spikelets narrow, erect, about 4 lines long, sessile in 2 or 3 clusters at the end of the stem with sometimes 1 or 2 clusters lower down, the floral bracts short, broad, and brown. Glumes very irregularly imbricate, often 2 or 3 flowers apparently in one glume with an empty glume immediately below it. Perianth-segments 6, 3 outer ones subulate, rigid with long glabrous points or awns, densely but shortly ciliate at the base, the hairs not showing outside the closed spikelet as they do in *L. erianthus ;* 3 inner segments short, oblong, obtuse, closely appressed to the ovary and base of the style, hardening round the fruit. Style slender with 3 stigmatic branches.—*Restio nutans*, R. Br. Prod. 245 (the ♀ plant) ; *R. Brownii*, Kunth, Enum. iii. 417 ; *R. tenellus*, Nees in Pl. Preiss. ii. 57 ; *Leptocarpus tenellus*, F. Muell. Fragm. viii. 90.

W. Australia. King George's Sound, *R. Brown*, and thence to the Stirling Ranges and Swan River, *Drummond*, 1*st coll. and n.* 999, *Preiss. n.* 1713, *Oldfield*, *F. Mueller*, and others.

Restio trisepalus, Nees in Pl. Preiss. ii. 58, described from a male specimen of Preiss's, which I have not seen, belongs most probably to this species.

7. **L. erianthus,** *Benth.*—Very closely allied to *L. aristatus* with the same habit and inflorescence, but the rhizome usually woolly, the stems not quite so slender and all simple in the specimens seen. Male spikelets spreading on pendulous or filiform clustered pedicels, narrow, 3 to 4 lines long. Glumes very broad, closely imbricate but acute or with short slightly spreading points. Perianth-segments 5 or 6, much shorter than the glumes, narrow-linear or more or less spathulate, very thin and unequal. Filaments very short. Female spikelets in dense clusters or heads, at first ovoid about 3 lines diameter and externally glabrous, when in fruit often globular, 4 to 6 lines diameter and white with the prominent hairs of the perianths. Glumes broad, irregularly imbricate as in *L. aristatus*, glabrous or ciliate. Perianth-segments 6, 3 outer ones rigidly subulate, densely hispid with long white hairs except the long fine points which are glabrous ; 3 inner segments short, oblong, obtuse, closely appressed to the ovary and style, hardened round the fruit. Style slender, divided to the middle into 3 stigmatic branches.—*L. aristatus*, F. Muell. Fragm. viii. 91, not of R. Br.

W. Australia, *Drummond*, *n.* 81 *and* 943; Albany and Stirling Range, *F. Mueller*, *Maxwell*, *Muir*; Gordon and Vasse Rivers, *Oldfield*. It is possible that this may prove to be a variety of *L. aristatus*, but the two appear to me to have been rightly distinguished by F. Mueller.

SECTION II. HOMŒANTHESIS. Spikelets in both sexes very small, clustered along the branches of a long panicle.

8. **L. ramosus,** *R. Br. Prod.* 250.—Rhizome unknown. Stems terete, erect, divided into a few long erect branches, above 2 ft. high, and sometimes the flowering branches again much divided. Sheathing scales closely appressed, shortly acute, in some specimens perhaps diseased, imbricate at the ends of the branches. Spike-like panicles dense and numerous in a long narrow interrupted panicle. Male spikelets very numerous, small and sessile in clusters along the short branches. Glumes less than a line long, acutely acuminate, almost aristate, the upper ones scarcely exceeding the lower. Perianth-segments acuminate, glabrous, the inner ones rather broader and less acuminate than the outer. The flowers examined had only 4 segments and 2 stamens in Dallachy's as well as in Fitzalan's specimens but they may very probably be sometimes 3-merous. Female inflorescence the same as the male, but the spikelets still smaller and more densely clustered. Glumes and 3 outer perianth-segments scarcely ½ line long, with fine points and glabrous or slightly ciliate, 3 inner segments shorter, obtuse, densely covered with a white woolly tomentum and closed over the glabrous ovary. Style filiform, divided to the middle into 3 or sometimes 2 stigmatic branches.—F. Muell. Fragm. viii. 92.

Queensland Endeavour River, *Banks and Solander*, Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan.*

9. **L. elatior,** *R. Br. Prod.* 250.—Rhizome unknown. Stems above 2 ft. high, rather stout and undivided in the specimens seen. Sheathing scales closely appressed, acuminate. Male specimens not seen. Female spikelets very small and numerous, of a rich dark brown, very densely crowded on the short branches of a long panicle, the bracts under the sessile clusters and spikelets acuminate with long fine points usually exceeding the spikelets. Spikelets about 1 line long and broad, the glumes acutely acuminate. Perianth-segments 6, under ½ line long, all nearly equal and quite glabrous or minutely ciliate. Ovary glabrous. Styles 2 or 3, free from the base or nearly so. Fruit about ½ line long, the pericarp readily splitting into 2 or 3.

N. Australia. Gulf of Carpentaria and North Coast (Arnhem's Land?) *R. Brown.* As observed in several other Restiaceæ some diseased inflorescences have larger flowers filled with the black granules of a fungus.

Queensland. Daintree River, *Fitzalan.*

10. **L. spathaceus,** *R. Br. Prod.* 250.—Rhizome unknown. Stems erect, 2 ft. high or more, divided into few rigid and erect or more numerous slender somewhat flexuose branches. Sheathing scales closely appressed, acute or shortly acuminate. Spike-like panicles

narrow and not much branched, the small spikelets numerous and clustered along the branches. Males in the specimens seen too imperfect for examination. Female spikelets ovoid, about 1 line long. Glumes acutely acuminate, rather spreading. Perianth-segments 6, narrow-lanceolate, acutely acuminate, all glabrous. Style-branches 2 or 3. Pericarp thin.—*L. desertus*, F. Muell. Fragm. viii. 93.

N. Australia. Gulf of Carpentaria, *R. Brown*; sources of the Roper River, *F. Mueller*. The majority of specimens in both instances diseased with the fungus.

11? **L. Schultzii**, *Benth.*—Rhizome shortly creeping, densely woolly, emitting numerous slender almost filiform much branched barren stems under 1 ft. high, and rigid erect simple or slightly branched flowering stems attaining 2 ft. or more, densely and softly cottony-villous as well as the rhachis of the panicle. Male spike-like panicle slender, narrow, not much branched, but only commencing flowering in our specimens, the young spikelets narrow, 1½ to 2 lines long. Glumes acuminate with scarious margins. Perianth-segments 5 or 6, the outer ones narrow and acuminate, the inner broader thinner and almost obtuse. Stamens 3. Females unknown.

N. Australia. Port Darwin, *Schultz*, *n.* 309.

7. HYPOLÆNA, R. Br.

(Calorophus, *Labill.* Calostrophus, *F. Muell.*)

Flowers diœcious, the males several together or rarely solitary, the females solitary, in spikelets with imbricate glumes and no bracteoles. Male flowers: Perianth-segments 6, narrow, glumelike or thin. Stamens 3, filaments filiform; anthers 1-celled. Female flowers: Perianth-segments (except in *H. longissima*) 6 or 4, short broad and very thin, almost hyaline. Staminodia 3 or none. Ovary 1-celled, with 1 pendulous ovule; styles or style branches 2 or 3, filiform, stigmatic from below the middle. Fruit a small ovoid or obovoid indehiscent nut.—Stems usually much-branched and often flexuose, leafless except the sheathing scales which are persistent. Male spikelets either solitary or 2 together within distant bracts along the branches, or several in a terminal panicle. Females solitary or 2 or 3 together at the end of the branches.

Besides the Australian species of which one is also in New Zealand, there are several from South Africa.

Sect. I. Calorophus. *Male spikelets solitary or 2 together, 1 sessile, the other shortly pedicellate, within distant floral bracts.*

Male spikelets 1-flowered . . . . 1. *H. longissima.*
Male spikelets several-flowered.
  Female spikelets terminal or sessile, 2 to 3 lines long. Eastern species . . . . 2. *H. lateriflora.*
  Female spikelets pedicellate, 1 line long. Western species . . . . 3. *H. gracillima.*

Sect. II. Euhypolæna. *Male spikelets all pedicellate in a small panicle. Female spikelets terminal solitary or in clusters of* 2 *or* 3.

Style-branches longer than the entire part. Eastern species.	4. *H. fastigiata.*
Style-branches shorter than the entire part. Western species.	5. *H. exsulca.*

SECTION I. CALOROPHUS. Male spikelets solitary and sessile or 2 together, one sessile the other pedicellate, within distant floral bracts, as in *Restio deformis* and its allies. Female spikelets solitary or few.

1. **H. longissima,** *Benth.* Stems slender, much-branched, flexuose or twining, "often climbing to the height of several yards," the whole plant quite glabrous. Sheathing scales appressed, often dark-coloured, the lower ones about ½ in. long and obtuse or with deciduous points, the upper ones and floral bracts gradually smaller, with short fine reflexed points or subulate laminæ. Male spikelets usually 2 together within the distant bracts. Glumes 2, shorter than the solitary flower. Perianth-segments lanceolate, with a small usually inflexed point, the 3 inner ones about 1½ lines long, the 3 outer shorter. Stamens 3 round a rudimentary ovary. Female spikelets solitary and terminal or on long peduncles, 1-flowered like the males. Glumes few, acuminate. Perianth of 6 or sometimes 4 nearly equal lanceolate acuminate segments nearly 2 lines long. Receptacle thick. Staminodia 3 or sometimes 2, rigid and persistent. Style branches 3 or 2. Nut hard, ovoid, about 1 line long.—*Calorophus elongatus*, Labill. Pl. Nov. Holl. ii. 78 partly; *Calostrophus elongatus*, F. Muell. Fragm. viii. 86.

Tasmania, *(Labillardière)*; foot of Mount Lapeyrouse, *C. Stuart.* Labillardière's description is evidently taken partly from this, although chiefly from the following species which he figures.

2. **H. lateriflora,** *Benth.*—Stems slender, very much branched and flexuose, sometimes nearly erect and under 1 ft., sometimes climbing to the height of 4 or 5 ft. Sheathing scales closely appressed, the upper ones as well as the floral bracts or sometimes nearly all with short subulate reflexed tips or filiform laminæ. Male spikelets usually 2 together within the distant floral bracts along the branches, one sessile the other shortly pedicellate, few flowered with 1 or rarely 2 empty glumes. Glumes thin, acute or acuminate, often slightly woolly-ciliate. Perianth-segments 6, narrow, nearly equal, the outer ones more acute than the inner. No rudiment of the ovary. Female spikelets 2 to 3 lines long, solitary within the 1, 2 or rarely 3 uppermost bracts. Glumes few, lanceolate, acutely acuminate, rigid, about 1½ lines long. Perianth of 6 or 4 broadly ovate very thin and hyaline segments, the inner ones scarcely longer than the ovary, the outer gradually rather larger. Styles 3 or 2, distinct from the base. Nut ovoid-globular, sessile on a thick receptacle.—*Restio lateriflorus*, R. Br. Prod. 247; *Calostrophus lateriflorus*, F. Muell. Fragm. viii. 87; *Calorophus elongatus*, Labill. Pl. Nov. Holl. ii. 78. t. 228, partly; Hook. f. Fl. Tasm. ii. 75; *Lepyrodia elongata*, Spreng. Syst. Cur. Post. 36; *Leptocarpus squarrosus* and *Restio crispatus*, Nees in Sieb. Agrost. n. 38, 39.

Queensland. Moreton Island, *F. Mueller*; Moreton Bay, *Leichhardt*; Brisbane River, *Bailey*.

N. S. Wales. Port Jackson, *R. Brown*; barren spots in the interior, *A. Cunningham*; New England, *C. Stuart*.

Victoria. From Brighton to Gipps' Land and ascending the Australian Alps to 6000 ft. *F. Mueller*; Mount William, *Sullivan*.

Tasmania. Table Mountain (Mount Wellington), *R. Brown*; abundant throughout the island *J. D. Hooker*.

Also in New Zealand.

After F. Mueller I have preferred Brown's specific name to Labillardière's, as the latter appears from his description to have confounded the preceding and the present species under one name.

3. **H. gracillima,** *Benth.*—Stems much-branched, more slender and intricate than in *H. lateriflora*, and attaining according to Oldfield 5 or 6 yards, though usually much smaller. Lower sheathing scales appressed, the upper ones and floral bracts loose, with a short fine reflexed point or lamina. Male spikelets usually 2 together within the distant floral bracts as in *H. lateriflora*, one sessile the other pedicellate, several-flowered, narrow-ovate, 2 to 3 lines long. Outer empty glumes 1 or 2, rather rigid, with a rigid dorsal point; flowering ones very thinly scarious but with a prominent dorsal point, the margins slightly 2-lobed at the top. Perianth-segments narrow, scarious, obtuse, the outer ones 1¼ lines long, the inner rather shorter. Female plant still more slender. Spikelets scarcely above 1 line long, on recurved pedicels projecting 1 or 2 lines beyond the floral bract. Glumes about 3. Perianth-segments 6, very thin and hyaline, broad and rather longer than the ovary. Styles 3 or sometimes 2, distinct, recurved.—*Calostrophus gracillimus*, F. Muell. Fragm. viii. 88; *Calorophus elongatus*, Nees in Pl. Preiss. ii. 68 as to the western plant only, not of Labill.

W. Australia. King George's Sound and neighbouring districts, *Preiss*, *n.* 1711, 1714, *Drummond*, *Oldfield*, *F. Mueller* and others, and perhaps the same species, Murchison River, *Oldfield*.

The male plant is not unlike the slender specimens of that of *H. lateriflora*, but the female (if correctly matched which I believe it to be) is very different, most remarkable for its minute pedicellate spikelets.

Section II. Euhypolæna. Male spikelets all pedicellate in a small panicle as in *Restio leptocarpoides* and several species of *Leptocarpus*. Female spikelets terminal, solitary or in clusters of 2 or 3.

4. **H. fastigiata,** *R. Br. Prod.* 251.—Stems much-branched, rather slender, erect or ascending and flexuose, from under 1 ft. to near 2 ft. high, glabrous or with a short loose white tomentum especially in the inflorescence. Sheathing scales dark-coloured, appressed, mostly with a short erect point. Male spikelets all pedicellate in a terminal panicle, oblong-linear or at length narrow-ovate, about 3 lines long or rather more when fully out. Glumes of a rich brown, rather broad with a short point, a few lower ones empty. Perianth-segments 6, 2 outer ones complicate and acutely keeled, the third lanceolate flat and

rather acute, the 3 inner rather shorter and more obtuse. Anthers almost sessile, dorsally attached very near the base to the very short filament. Female spikelets solitary and terminal or rarely 2 or 3 clustered together, 2 to 3 lines long. Glumes much more acuminate than in the males. Perianth-segments 6, thinly scarious, very broad and only about as long as the ovary. Styles shortly connate at the base. Nut hard, sessile on a thickened receptacle.—Hook. f. Fl. Tasm. ii. 74, t. 137; F. Muell. Fragm. viii. 84; *Restio clavatus*, R. Br. Prod. 246.

N. S. Wales, Port Jackson, *R. Brown* and many others.
Victoria. Glenelg River, *Robertson*, Port Phillip and neighbourhood, *F. Mueller* and many others; Grampians, *Sullivan*.
Tasmania, *R. Brown;* abundant in sandy places where wet in winter, *J. D. Hooker* and others.
S. Australia. Guichen Bay and Encounter Bay, *F. Mueller*.

5. **H. exsulca**, *R. Br. Prod.* 251.—Male plant closely resembling *H. fastigiata*, the stems usually less branched and the much-branched barren ones rare, the white cotton of the inflorescence very scanty or none, the spikelets rather broader, the perianth and stamens the same. Female plant more rigid with flexuose branches. Spikelets either solitary and terminal or more frequently 2 or sometimes 3 together near the ends of the branches, each 4 to 6 lines long. Glumes lanceolate with long points, at first of a bright brown, but when fully out more rigid and as the fruit ripens the outer ones becoming white. Perianth-segments broad and thin scarcely exceeding the ovary and shorter than the fruit. Style elongated, the 3 branches shorter than the entire part. Nut ovoid, hard, on a thick receptacle as in other species.—Nees in Pl. Preiss. ii. 69 (♀); *H. fastigiata*, Nees, l. c. (also ♀); *H. Esenbeckii*, F. Muell. Fragm. viii. 86; *Restio clavatus*, Nees, l.c. 58 (♂), not of R. Br.; *H. grandiuscula*, F. Muell. Fragm. viii. 85 (spikelets brown but young); *Restio vacillans*, Steud. Syn. Glum. ii. 255.

W. Australia. King George's Sound, *R. Brown*, *A. Cunningham*, *F. Mueller* and others and thence to Swan River, *Drummond* 1*st coll. and n.* 337 (♂) and 338 (♀) *Preiss*, *n.* 1703, 1783 and others.

In Brown's Prodromus the letters J. M. D. are, probably by some clerical error, affixed both to *H. fastigiata* and *H. exsulca*, which he seems at one time to have regarded as one species, but his herbarium as well as his diagnosis clearly show that he meant to apply the former name to the eastern, the latter to the western plant. In all the flowers I have examined the difference in the style independently of other characters has appeared constant.

8. LOXOCARYA, R. Br.

Flowers diœcious or monœcious, the males several together the females solitary, in spikelets with imbricate glumes and no bracteoles. Male flowers: Perianth-segments 6, glume-like or thin and almost hyaline, filaments filiform or flattened, anthers 1-celled. No rudiment of the ovary or rarely a small one in the terminal flower. Female

flowers: No staminodia. Perianth of 3, 4 or 6 short broad very thin segments or none. Ovary 1-celled with 1 pendulous ovule. Style simple, filiform, stigmatic from below the middle. Fruit a small ovoid or obovoid usually hard nut, indehiscent except in *L. cinerea.*—Stems usually much branched and often flexuose, the branches often densely clustered, the sheathing scales persistent. Male spikelets either terminal or 2 or 3 distant along the branches and sessile; females, solitary and terminal.

The genus is limited to West Australia.

Female perianth-segments 3 or 4 (where known).
  Flowering branches long and slender.
    Glabrous . . . . 1. *L. densa.*
    Softly villous . . . . 2. *L. vestita.*
  Flowering branches short and clustered.
    Stems above 1 ft. Male spikelets 1 or 2 sessile on the branch besides the terminal one. Females on the same specimen . . . . 3. *L. virgata.*
    Stems under 1 ft. Male spikelets solitary on the filiform branches appearing lateral from the bract continuing the branch, or few in very irregular dichotomous cymes . . . . 4. *L. pubescens.*
Female flowers without any perianth within the enclosing glumes.
  Spikelets solitary on peduncles densely clustered with leaf-like barren branches . . . . 5. *L. fasciculata.*
  Flowering branches elongated, flexuose, with distant sessile spikelets.
    Stems glabrous or with very few scattered hairs . . . 6. *L. flexuosa.*
    Stems more or less scabrous-pubescent. Nut dehiscent . 7. *L. cinerea.*

1. **L. densa,** *Benth.*—Stems quite glabrous, considerably above 1 ft. high, with numerous long slender flexuose branches tuberculate-scabrous. Sheathing scales rigid, appressed, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Male spikelets usually several, sessile and distant at the ends of the branches, very narrow and erect, about 3 lines long. Glumes brown, 1 or 2 outer ones empty with long points, the flowering ones few, with short points. Perianth-segments broadly linear, with dark centres and scarious margins, 2 outer ones concave, the 3rd and 3 inner ones flat. Filaments flattened. Female spikelets 1 or 2 only at the ends of the branches, very narrow, about 4 lines long. Glumes usually about 4, the outer ones with long the inner with short points. Perianth-segments 4, 2 outer ones about 2 lines long, broad and very obtuse, very thin but slightly coloured, 2 inner ones much shorter and broader and quite hyaline. Style undivided, with a long thick stigmatic portion.—*Calorophus densus,* Nees. in Pl. Preiss. ii. 67.

W. Australia. Swan River, *Drummond,* 1*st coll.* (♂); King George's Sound, *Muir* (♀).

2. **L. vestita,** *Benth.*—Stems 6 to 10 in. high, paniculately branched and very flexuose like *L. densa,* but softly villous with whitish hairs. Sheathing scales appressed. Male spikelets solitary,

terminating the slender branches or rarely a second one lower down, very narrow and erect, about 2 lines long. Glumes 2 outer empty shorter than the others, broad and acuminate with short fine points, 3 or 4 flowering ones with involute scarious margins. Perianth-segments 6. Females unknown.

W. Australia, *Drummond, n.* 388.

3. **L. virgata,** *Benth.*—Stems erect, 1 to 1½ ft. high, loosely and shortly pubescent. Sheathing scales broad and open, 2 or 3 of the lower ones empty, the others enclosing dense clusters of short slender straight or very flexuose branches, most of them flowering. Male spikelets usually 2 or 3 on the branch, terminal or sessile and distant within lanceolate acuminate bracts, each spikelet ovate, scarcely 2 lines long. Flowers rather numerous. Glumes acute, about 1 line long. Perianth-segments 6, very narrow, hyaline, unequal. Female spikelets solitary on some of the branches of the lower clusters in specimens otherwise male, narrow, acuminate, 2½ to 3 lines long. Glumes few, the outer ones shorter with slightly spreading points, the inner ones less pointed, all closely enveloping each other and the solitary terminal flower. Perianth-segments 3, very narrow, thin and hyaline Ovary of the genus but the styles fallen away from our specimens.

W. Australia, *Drummond, n.* 74 *and* 113. Another 113 however of the same collector appears to be the male of some *Hypolæna.*

4. **L. pubescens,** *Benth.*—Stems glabrous or loosely pubescent with spreading hairs, under 1 ft. high; branches numerous, flexuose but almost filiform, irregularly clustered but not so dense nor so short as in *L. fasciculata.* Sheathing scales rather broad, but appressed, often produced into linear points or laminæ. Male spikelets numerous but solitary and terminal or apparently lateral, the branch being continued by a subulate bract, or sometimes few in an irregularly dichotomous cyme, all small, broadly ovoid, about 2 lines long, many-flowered. Glumes broad, scarcely pointed, brown with scarious margins, a few outer ones shorter more pointed and empty. Perianth-segments narrow and hyaline, or 2 outer ones rather longer and slightly coloured. Female spikelets 1 or 2 on the branch, sessile, narrow, 3 to 4 lines long. Glumes few, the outer ones short with long points, often ciliate, the inner ones long and narrow, acuminate, dark brown. Perianth-segments 6, very thin and hyaline, broad, very obtuse or truncate, shorter than the ovary, withering away from the ripe nut.—*Restio pubescens,* R. Br. Prod. 247; *Hypolæna pubescens,* Nees. in Pl. Preiss. ii. 69, partly.

W. Australia. King George's Sound, *R. Brown, F. Mueller, Preiss,* n. 1720; Busselton, *Pries.*

5. **L. fasciculata,** *Benth.*—Stems erect, 6 to 8 in. high in the specimens seen but probably sometimes longer, sprinkled as well as the

branches with a few long hairs. Sheathing scales broad, mostly aristate, all or nearly all enclosing a dense cluster of short leaf-like triquetrous branches not above 1 in. long. Male peduncles mixed with the branches and about as long, each bearing a single oblong spikelet of about 2 lines, containing 2 to 5 flowers and usually 1 empty glume. Glumes rigidly scarious, glabrous or slightly ciliate, obtuse or with a short fine point. Perianth-segments narrow, almost hyaline. Anthers exserted. The rudimentary ovary often present. Female spikelets several, sessile or nearly so in the cluster of branches, consisting of 4 or 5 hard narrow acuminate glumes closely enveloping each other and the single terminal flower. The outer glume about 3 lines long including the rigid point, the inner ones with shorter points, the innermost almost obtuse. Perianth of 6 very thin membranous appressed orbicular segments, or sometimes none? Style long, undivided, stigmatic from near the base. Nut with a thick callous apex.—*Restio fasciculatus*, R. Br. Prod. 247; *Desmocladus Brunonianus*, Nees in Pl. Preiss. ii 56; F. Muell. Fragm. viii. 98.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Preiss*, *n.* 1723, *F. Mueller*, *Oldfield*.

Drummond's specimens, n. 356, referred here, may possibly be diseased females. The stems are taller, the clustered simple branches short, the numerous sessile spikelets only 1 to 1½ lines long, glumes very obtuse, completely enveloping the small ovary, containing a deformed ovule and mucronate by a short rudiment of a style.

6. **L. flexuosa,** *Benth.*—Stems glabrous or loosely sprinkled with a few hairs, mostly under 1 ft. high, with numerous flexuose rather long branches. Sheathing scales appressed in the lower part of the stem, broader and looser or worn away under the branches. Male spikelets several, sessile and distant along the branches, scarcely 2 lines long at first, narrow-ovate when fully out, many-flowered. Perianth-segments 6, narrow. Female spikelets 1 or 2 to each branch, very narrow, rather above 2 lines long when fully out. Glumes 2 outer ones shorter than the others with rather long points, about 4 inner ones acute or obtuse, broad but each one closely rolled round the next and the innermost round the ovary. No perianth or staminodia. Style undivided with a long stigmatic portion. Nut with a hardened apex.—*Restio flexuosus*, R. Br. Prod. 217; *Calorophus flexuosus*, Nees in Pl. Preiss. ii. 68; *C. crispatus*, Nees, l. c. 67? excl. syn. R. Br.

W. Australia. King George's Sound, *R. Brown* (♂), *A. Cunningham* and others; and thence to Swan and Murchison rivers, *Drummond*, 1*st coll. and n.* 840, *also n.* 96, *Preiss*, *n.* 1717, 1718, *Oldfield* and others; Dirk Hartog's Island, *Milner*.

The northern specimens are generally more rigid with thicker stems and branches than the southern, and the males sometimes assume the aspect of some species of *Restio* allied to *R. dimorphus*, the southern more slender ones come nearer in habit to some states of *L. pubescens*, but as far as I have ascertained the absence of the female perianth seems constant.

7. **L. cinerea,** *R. Br. Prod.* 249.—Stems under 1 ft. high with numerous flexuose rather long branches, all scabrous, dotted and often

loosely pubescent. Sheathing scales broad and loose, short or worn away under the panicle. Male spikelets usually several, sessile and distant along the branches, ovate, about 1½ lines long, many-flowered. Glumes ovate or ovate-lanceolate, acute or very shortly aristate, 1 or rarely 2 lower ones empty. Perianth-segments 6, narrow-linear, hyaline, all equal or 1 or 2 rather longer than the others. Female spikelets terminating short branches or peduncles, very narrow, about 2 lines long. Glumes few (about 5) broad and closely rolled round each other enclosing the ovary as in *L. flexuosa*, the outermost one shorter and aristate, the innermost one also short but obtuse. No perianth or staminodia. Style long, undivided, stigmatic from below the middle. Fruit at length dehiscent on one side.—*Calorophus asper*, Nees in Pl. Preiss, ii. 67; *Hypolæna pubescens*, Nees l. c. 69, partly.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Oldfield*, *F. Mueller* and others, and thence to Swan River, *Drummond*, *n.* 340, *Preiss*, *n.* 1694, 1716, 1721, and others, eastward to Mount Barren, Phillips and Garner Rivers, *Maxwell.*

9. LEPIDOBOLUS, Nees.

Flowers diœcious, both males and females several together, in spikelets with imbricate glumes and no bracteoles. Perianth of 5 or 6 narrow glume-like or scarious segments. Male flowers: Stamens 3; filaments filiform; anthers 1-celled. Female flowers: No staminodia. Ovary 1-celled, 1-ovulate; style simple, filiform, stigmatic from below the middle. Fruit a small indehiscent ovoid or obovoid nut.—Stems simple, erect or flexuose, the sheathing scales very deciduous leaving distant annular scars. Spikelets solitary and terminal, or in the males with 1 or few others lower down.

The genus is limited to extratropical Australia.

Rhizome creeping. Stems slender. Spikelets 1 or 2.
  Male spikelets nearly globular, about 3 lines diameter.
    Glumes scarcely ciliate, with very short joints . . 1. *L. drapetocoleus.*
  Male spikelets ovoid, ½ to ¾ in. long. Glumes ciliate,
    rounded or acute, with fine points . . . . 2. *L. Preissianus.*
Stems rather stout, densely tufted. Male spikelets 3 or 4,
  globular, ½ in. diameter. Glumes ciliate, rounded or
  truncate, with very fine points . . . . 3. *L. chætocephalus.*

1. **L. drapetocoleus**, *F. Muell. Fragm.* viii. 84.—Rhizome creeping, woolly-hairy. Stems in our specimens all simple, slender, flexuose, 1 ft. long or more, glabrous, with a few short brown sheathing scales persistent at the very base, the others all very deciduous leaving brown annular scars. Male spikelets solitary and terminal or with a second pedicellate one lower down in the axil of a deciduous floral bract, all broadly ovate, about 3 lines long. Glumes oblong, acuminate, with a short point, the outer ones broader, but very few empty. Perianth-segments scarious, about 1½ lines long, all narrow but 2 outer ones

rather broader upwards concave and ciliate, the others flat. Anthers exserted. Some specimens probably female but diseased have broader spikelets enclosing an utricle filled with the black granules of a fungus.

Victoria. Glenelg River, *Robertson ;* Grampians, *F. Mueller.*
S. Australia. Onkaparinga River, *F. Mueller.*

2. **L. Preissianus,** *Nees in Pl. Preiss.* ii. 66.—Rhizome creeping, woolly-hairy. Stems about 1 ft. high, rather slender, simple, erect or flexuose, glabrous, with a few short persistent scales at the base, the rest very deciduous leaving distant scars. Male spikelets solitary and terminal or a second sessile one lower down, at first ovoid and ½ in. long but at length oblong and ¾ in. Glumes very numerous, rigidly scarious, the outer ones broad, the inner gradually narrower, almost acute and terminating in fine points. Perianth-segments 6, linear, the inner ones rather longer than the outer. Female spikelets longer and narrower. Glumes loosely imbricate especially the outer empty ones, 1 or 2 of the lowest broad, almost without points, the upper empty, ending as well as the flowering ones in long rigid points. Perianth-segments usually 5, 2 outer ones complicate and keeled, the 3 inner shorter and broader and flat. Style long, stigmatic from below the middle.—F. Muell. Fragm. viii. 83.

W. Australia. Swan River, *Drummond,* 1*st coll.*, *Preiss, n.* 1755 ; Murchison River, *Oldfield.*

3. **L. chætocephalus,** *F. Muell. Fragm.* viii. 84.—More rigid than *L. Preissianus*, the rhizome not elongated, the bases of the stems densely tufted. Male spikelets or heads 2 to 4, 1 terminal the others sessile, almost globular, ½ in. diameter when fully out. Glumes oblong or the outer ones broader, all rounded or truncate and ciliate at the end, with very fine points. Perianth-segments usually 5, narrow, scarious, nearly equal. Female spikelets much shorter than in *L. Preissianus*, with very few empty bracts. Upper flowering glumes only seen in fruit, broadly ovate, ciliate, with fine points. Nut included in the perianth, the style already fallen away.

W. Australia. Swan River, *Drummond,* 1*st coll. and n.* 954 ; Murchison River, *Oldfield.*

10. CHÆTANTHUS, R. Br.

(Prionosepalus, *Steud.*)

Flowers diœcious, the males unknown. Female flowers several together in short spikelets with imbricate glumes. Perianth of 3 outer linear hyaline segments, with 3 inner hair-like. No staminodia. Ovary 1-celled, 1-ovulate ; style simple, stigmatic from below the middle.—Stems simple, with persistent closely appressed sheathing scales. Spikelets small, crowded in a terminal cluster.

The genus is limited to a single species, endemic in West Australia.

1. **C. leptocarpoides,** *R. Br. Prod.* 251.—Male plant unknown. Female plant: stems densely tufted, slender, undivided, about 1 ft. high. Sheathing scales narrow, closely appressed, mostly with short fine erect points. Spikelets about 1½ lines long, glabrous, of a dark brown, rather numerous but collected in a terminal ovoid branching but compact cluster 3 or 4 lines diameter and sometimes rather long. Flowers 6 to 8 or even more in the spikelet, a few outer empty glumes and the outer flowering ones dark brown and acute, the inner glumes between the pedicels very thin hyaline and narrow. Perianths on very short cylindrical pedicels on a flat receptacle, 3 outer linear segments about 1 line long, the 3 inner hair-like segments about half as long. Style scarcely exceeding the perianth. Fruit apparently an indehiscent nut, but not seen ripe.—F. Muell. Fragm. viii. 97; *Prionosepalum Gilberti,* Steud. Syn. Glum. ii. 266 (the style described as an anantherous stamen).

W. Australia, King George's Sound, *R. Brown,* and probably in the same neighbourhood, *Drummond, n.* 392; Busselton, *Pries.*

11. ONYCHOSEPALUM, Steud.

Flowers diœcious, both sexes several together in solitary terminal spikelets, with imbricate glumes. Perianth-segments in both sexes 3, very thin and hyaline, contracted into claws. Stamens 3; anthers 1-celled. Ovary stipitate, 1-ovulate, with a simple slender style, stigmatic in the upper portion. Ripe fruit unknown.—Stems simple, without sheathing scales except at the base.

The genus is limited to the single Australian species.

1. **O. laxiflorum,** *Steud. Syn. Glum.* ii. 249.—Stems from a densely branched and tufted base erect, slender, 6 to 10 in. high, undivided and without any sheathing scales except a few short imbricate ones at the base. Male spikelet many-flowered, ovate, 3 to 4 lines long, of a rather pale brown. Glumes about 1½ lines long, rather broad with a fine point, often deciduous, leaving the flower exposed. Perianth-segments linear-oblong, shorter than the glumes, contracted into distinct claws. Anthers exserted. No rudiment of the ovary. Female spikelet about the size of the male, but with rather numerous outer empty glumes broad brown and very rigid nearly 2 lines long besides a rigid point; flowering glumes also rather numerous. Perianth-segments like those of the males or narrower, with a longer more capillary claw. —F. Muell. Fragm. ix. 51.

W. Australia, *Drummond, n.* 325 (*or* 326) *and* 327. This plant has the aspect of some *Cyperaceæ,* but the single ovule is certainly pendulous and the style undivided.

ORDER CXLIII. CYPERACEÆ.

Flowers hermaphrodite or unisexual, in little green or brown spikes called *spikelets,* consisting of several scale-like bracts called *glumes,*

either distichous as in *Gramineæ* or imbricated all round the rhachis, with one sessile flower in the axil of each, or the lower ones and sometimes a few at the end empty. No normal perianth (except in *Oreobolus*), but replaced in some genera by 6 or fewer, rarely more, bristles or small scales. Stamens 3 or fewer or rarely 4 to 6 or indefinite; filaments free, filiform or slightly flattened; anthers usually exserted from the spikelet, attached by their base, oblong or linear, with 2 parallel cells opening longitudinally, the connective usually more or less produced beyond the cells into a small point or appendage. Ovary entire, 1-celled, with 1 erect ovule; style terminal, filiform or variously thickened at the base, more or less deeply divided into 2 or 3 rarely more filiform spreading or recurved branches stigmatic and papillose or rarely shortly plumose from the base, and therefore often termed stigmas. Fruit a small seed-like nut, flattened when the style is 2-cleft, more or less distinctly 3-angled when it is 3-cleft. Seed erect, albuminous, with a small lens-shaped globular or ovoid embryo in its base.—Herbs often resembling in aspect the Restiaceæ or still more frequently the Gramineæ, but usually stiffer than the latter with solid or very rarely slightly hollow stems. When perennial the rhizomes often emit short stolons covered with short sheathing scales, but rarely present in dried specimens taken at the time of flowering. Leaves chiefly at the base of the stem, the outer or radical ones dilated at the base into open sheaths or reduced to sheathing scales in continuation of those of the rhizome, the inner ones as well as the stem-leaves when present embracing the stem with closed tubular sheaths, the lamina usually narrow and grass-like, and sometimes the stems quite leafless except a few sheathing scales at the base. Spikelets either solitary or clustered and terminal or apparently lateral from the subtending erect bract apparently continuing the stem, or variously collected in simple or compound spikes umbels or panicles; when umbellate irregularly so, one spikelet cluster or partial umbel being always sessile, whilst the others are supported on peduncles or *rays* of unequal length. The whole inflorescence its branches and the individual spikelets almost always subtended by bracts, the lower ones often long and resembling the stem leaves, the others gradually smaller, the inner ones and sometimes all small and glume-like.

A large Order, abundantly distributed all over the globe, but more especially in moist situations or on the edges of waters. Of the 33 Australian genera 18, many of them numerous in species, are common to the New and the Old World either tropical extra-tropical or both, 7, of which only one (*Gahnia*) has more than 10 species are limited to the Old World, but represented in Asia or in both Asia and Africa, 6 are endemic, all monotypic or of very few species, besides *Lepidosperma*, a large genus almost endemic, being represented elsewhere only by a single South Chinese species.

The delimitation of the larger hermaphrodite genera of Cyperaceæ and the distribution of their numerous species as well as of the genera themselves into well-defined groups is attended with peculiar difficulty. Although the characters separating the great typical genera *Cyperus Scirpus* and *Schœnus* are constant as to the great majority of species yet there are a few intermediate ones which have been equally well referred to the one or to the other. Some of the characters relied upon by the great cyperographers, Brown and Kunth, such as the presence or absence of hypogynous bristles, have in many instances broken down in consequence of the enormous encrease of known species since their time. Nees v. Esenbeck created some confusion by splitting up the genera upon minor characters which have proved still less constant, and that confusion has been very much encreased by Steudel's most unsatisfactory compilation. Bœckeler, in the last volumes of the Linnaea, has since rendered good service by his elaborate enumeration of the Cyperaceæ of the Berlin herbarium, but, as to the Australian species, he has generally had but single specimens often very imperfect to work upon, and appears to me to have established several upon very insufficent grounds. His long so-called diagnoses or rather ablative descriptions are useful as showing the variations species are subjected to, but, not being contrasted, give but little assistance in the practical determination of species. Another difficulty I have had to contend with proceeds from the wide range of a large portion of the Australian species, and in many cases it would require a more careful study of identical or representative species in other countries than I have been able to make, to ascertain whether those here adopted are really distinct. The order more than any other requires a careful revision on the part of a competent botanist, who could devote years to the task of carefully scrutinising the principal British and Continental herbaria.

I am indebted to Dr. Garcke, Director of the Royal Herbarium at Berlin, for the loan of all the Australian Cyperaceæ it contains which enabled me to identify those described by Bœckeler; unfortunately, however, it does not comprise those collected by Mrs. Amalia Dietrich in Queensland and described by Bœckeler in the 'Flora' for 1875, and I had overlooked this paper till after I had written out the order for press and returned Baron Mueller's collections. It seems very unlikely that Mrs. Dietrich should have found 21 new species in a part of the country so thoroughly explored by Baron Mueller's numerous correspondents, and after as careful a study as I could make of Bœckeler's complicated diagnoses, I have identified with more or less of plausibility the greater number of them. There are two which I had already described as new under other names for which I have substituted Bœckeler's, the others appear to me to be identical with or very slight varieties of published species, with the exception of a *Scleria*, about which I feel very uncertain.

TRIBE I. **Scirpeæ.**—*Spikelets solitary clustered capitate or umbellate, with several often numerous hermaphrodite flowers rarely (except in* Kyllinga*) reduced to* 2 *or* 1. *Empty glumes at the base usually only* 1 *or* 2. *Hypogynous bristles or scales when present filiform or flat.*

(Empty glumes 3 or 4 and flowers 2 or 3 in *Fimbristylis cyperoides*.)

Spikelets small in a dense simple or lobed head or short spike, with 1 rarely 2 flowers. Two inner glumes enclosing the nut and falling off with it	1. KYLLINGA.
Spikelets clustered or spicate, the clusters or spikes solitary or in simple or compound umbels. Glumes distichous. Style not bulbous. No hypogynous bristles	2. CYPERUS.
Spikelet solitary. Glumes imbricate all round. Hypogynous bristles usually present. Nut crowned by the persistent dilated base of the style	3. HELEOCHARIS.
Spikelets solitary clustered or umbellate. Glumes imbricate all round or distichous. No hypogynous bristles. Style thickened or bulbous at the base but articulate on the nut	4. FIMBRISTYLIS.
Spikelets solitary or clustered, often lateral, or in a compound umbel. Glumes imbricate all round. Style continuous with the nut. Hypogynous bristles present or not	5. SCIRPUS.
Spikelets in a terminal head or cluster. Glumes imbricate all round. Hypogynous scales 2, flat and parallel with the glume	6. LIPOCARPHA.
Spikelets clustered, the clusters usually paniculate. Glumes imbricate all round. Hopogynous scales 3, flat	7. FUIRENA.

(18. SCHŒNUS has sometimes very nearly the characters of *Cyperus*.)

TRIBE II. **Hypolytreæ.**—*Spikelets solitary clustered or paniculate, with several usually numerous flowers all hermaphrodite or some male only. Glumes imbricate all round, several of the lowest usually empty. Flowers within the glumes flat, with 2 complicate keeled hypogynous scales, and often flat linear ones within them.*

- No flat scales within the two keeled ones. Stamens 3 or fewer. Spikelets capitate or paniculate . . . 8. HYPOLYTRUM.
- Two flat scales within the 2 keeled ones. Stamens 3. Nut wholly exserted. Spikelets small paniculate . 9. EXOCARYA.
- Four flat scales within the 2 keeled ones. Stamens 3. Nut included. Spikelets rather large (paniculate in the Australian species) . . . . 10. MAPANIA.
- Several flat scales within the 2 keeled ones. Stamens 6. Nut large, very prominently ribbed and furrowed. Spikelets clustered in a dense panicle . . . . . 11. SCIRPODENDRON.
- Numerous flat scales within the 2 keeled ones. Stamens 6 or more. Spikelet solitary, lateral.
  - Spikelet ovoid, or oblong. Glumes closely imbricate concealing the inner scales . . . . 12. LEPIRONIA.
  - Spikelet globular or ovoid. Glumes loosely imbricate disclosing the inner scales . . . . 13. CHORISANDRA.

TRIBE III. **Rhynchosporeæ.** *Spikelets capitate spicate or paniculate, rarely solitary or umbellate, with 1 rarely 2 (in* Schœnus *2 to 6) hermaphrodite fertile flowers, and sometimes 1 or more male or sterile flowers above or below. Empty glumes at the base often more than 2. Hypogynous bristles or scales when present filiform or flat.*

(Flowers sometimes unisexual by abortion in 26 *Caustis*.)

- Spikelets solitary, with 1 flower, 3 glumes, a perianth of 6 segments and 3 stamens. Dwarf leafy plant in cushion-like tufts . . . . 14. OREOBOLUS.
- Spikelets small, in a dense ovoid spike or head, with 1 flower, and 4 glumes, the inner one fleshy enveloping the nut. No hypogynous bristles. Low branching leafy plant . . . . 15. REMIREA.
- Glumes imbricate all round. Style-branches 2. Nut crowned by the thickened persistent base of the style.
  - Empty glumes several. Hypogynous bristles 6 or irregularly fewer, slender or small . . . . . . 16. RHYNCHOSPORA.
  - Empty glumes 2. Hypogynous bristles 4, long and rigid . . . . 17. CYATHOCHÆTE.
- Glumes distinctly distichous. Style-branches 3, rarely 4.
  - Flowers 2 to 6, all or the lower ones fertile. Rhachis between the flowers elongated curved or flexuose 18. SCHŒNUS.
  - Flowers 1 or 2, both fertile or the lowest male or sterile.
    - No hypogynous bristles. Spikelets in a narrow panicle or axillary . . . . 19. ELYNANTHUS.
    - Hypogynous bristles or scales 3. Spikelets in a terminal head . . . . 20. MESOMELÆNA.
    - Hypogynous bristles 6, long plumose and spreading under the nut . . . . 21. CARPHA.
- Glumes imbricate all round, or when few obscurely distichous. Style-branches 3, rarely 4 or 8.

Hypogynous bristles small and not thickened under the nut . . . . 22. Tricostularia.
Hypogynous scales often at first minute, thickened and acuminate under the nut . . . . 23. Lepidosperma.
No hypogynous bristles or scales.
  Spikes paniculate, when 2-flowered the lowest fertile, its glumes as long as the outer empty ones. Stamens 3 . . . . 24. Cladium.
  Spikelets paniculate, when 2-flowered the lowest sterile; flowering glumes obtuse and shorter than the outer empty ones. Stamens 3 to 6 . . 25. Gahnia.
  Spikelets solitary or clustered in an irregularly branched inflorescence, when 2-flowered the lowest sterile, and often unisexual. Stamens 3 to 6. Nut crowned by the ovoid or oblong base of the style . . . . 26. Caustis.
  Spikelets in a small terminal head. Stamens or staminodia 6 . . . . 27. Arthrostyles.
  Spikelets numerous, in a cylindrical spike enclosed in long leafy sheaths. Stamens 6 . . . . . 28. Reedia.
  Spikelets clustered or loosely paniculate. Stamens indefinite (12 or more) . . . . 29. Evandra.

Tribe IV. **Sclerieæ.** — *Flowers strictly unisexual, in unisexual or androgynous spikelets. No utricle enclosing the females. Ovary and nut seated on a disk.*

Single Australian genus . . . . 30. Scleria.

Tribe V. **Cariceæ.**—*Flowers strictly unisexual, in unisexual or androgynous spikelets, the females enclosed in an utricle or perigynium.*

Spikelets solitary, androgynous. Bristle within the utricle protruding beyond it and hooked at the end 31. Uncinia.
Spikelets solitary, spicate or paniculate; unisexual or androgynous. Bristle within the utricle not exserted nor hooked and often deficient . . . . . 32. Carex.

Tribe I. Scirpeæ.—Spikelets solitary clustered capitate or umbellate, with several often numerous hermaphrodite flowers, rarely except in *Kyllinga* reduced to 2 or 1. Empty glumes at the base usually only 1 or 2. Hypogynous bristles or scales when present filiform or flat.

1. KYLLINGA, Rottb.

Spikelets with a single apparently terminal hermaphrodite flower or with a second smaller usually male or imperfect flower immediately above it. Glumes 3 or 4, distichous, concave or navicular and keeled, of which the upper 2 closely enclosing the flower and fruit and at length falling off with it, the short stipes or rhachis of the spikelets being articulate at or above the base, the lowest glume small and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, usually deciduous; stigmatic branches 2, filiform. Nut sessile, flat, without any hypogynous disk.—Perennials or rarely annuals with simple stems leafy at the base only. Spikelets small, very numerous, densely crowded in 1, 3 or rarely more terminal globular or oblong-cylindrical heads, sessile

within an involucre of 2 to 4 unequal linear leafy bracts. When the second flower is present it is always enclosed in or subtended by a small hyaline additional glume, and, if perfect, both the nuts are enclosed in the 2 larger glumes.

The genus is widely spread over the warmer regions of the New and the Old World and the Australian species are none of them endemic, all four appear to be Asiatic and two at least also African and American, but the characters upon which Boeckeler and others have distinguished a large number of species are often very vague or trifling, and require further scrutiny before the extent of the geographical range of the principal forms can be determined. F. Mueller proposes to unite the genus with *Cyperus*, to which it is certainly nearly allied, but the peculiar structure of the spikelet is quite constant in all the species I have examined.

Heads of spikelets solitary and globular, or very rarely with 2 short lateral ones.
  Second male flower usually present. Nut ovate, pale, nearly as long as the glumes. Larger glumes very unequal . . . . 1. *K. intermedia.*
  No second flower. Nut ovate, pale, much shorter than the glume. Larger glumes nearly equal, acutely keeled . . . . 2. *K. monocephala.*
Central head of spikelets oblong-cylindrical, with or without two or more shorter lateral ones. No second flower. Larger glumes scarcely keeled.
  Nut large, broad, usually very dark. Head of spikelets usually single . . . . 3. *K. cylindrica.*
  Nut narrow, pale. Heads of spikelets 3 to 5 . . . . 4. *K. triceps.*

1. **K. intermedia,** *R. Br. Prod.* 219.—Stems from a creeping rhizome slender, 6 in. to above 1 ft. high. Leaves grass-like, about 1 line broad, much shorter than the stem. Involucre of about 3 very unequal narrow bracts. Flower-head single, globular, about 3 lines diameter, the spikelets rather more acuminate and spreading than in *K. monocephala*, about 1½ lines long. The two larger glumes several-nerved without any very prominent keel, the innermost considerably larger than the other, and enclosing usually a second male flower in a small hyaline glume, the lowest empty glumes usually close under the larger ones and falling off with them. Nut ovate, pale-coloured, nearly as long as the glumes.

Queensland. Rockhampton, *O'Shanesy*; Moreton Bay or neighbourhood, *Leichhardt.*

N. S. Wales. Richmond, *R. Brown*; Blue Mountains and Liverpool Plains, *C. Moore*; Clarence River, *Beckler*; New England, *C. Stuart.*

Victoria. Mitta Mitta and Lower Hume Rivers, *F. Mueller.*

This species apparently the commonest in Australia is also in New Caledonia and probably in East India, often confounded with *K. monocephala.*

2. **K. monocephala,** *Rottb. Ic. et. Descr. Pl.* 13, *t.* 4, *f.* 4.—Stems tufted but often decumbent or stoloniferous at the base or from a long creeping rhizome, rarely above 1 ft. high and often only 6 in. Leaves shorter than the stem and very narrow in the typical form. Involucral bracts long and narrow. Flower-head globular or ovoid, about 3 lines diameter or sometimes lengthening to 4 lines, solitary or

very rarely with a small one on each side. Spikelets 1-flowered, the larger glumes nearly equal or the inner one rather longer especially when in fruit, many-nerved with a prominent usually ciliate keel. Nut broadly ovate or obovate, pale-coloured, much shorter than the glume. —R. Br. Prod. 219; Kunth, Enum. ii. 129; Bœckel. in Linnæa, xxxv. 427; *K. pumila*, Mich.; Kunth, Enum. ii. 132, at least as to the Australian plant; *Cyperus monocephalus*, F. Muell. Fragm. viii. 271.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton *O'Shanesy*.

N. S. Wales. Port Jackson (rare) *R. Brown*, *C. Moore*; Paramatta (only recently appeared there) and Richmond, *Woolls*.

Var. *latifolia*. Leaves and involucral bracts 1½ to 2 lines broad.—Moreton Bay, *Leichhardt*; Johnstone River, *Dallachy*. In one specimen from Rockhampton, *Thozet*, the stem is nearly 2 ft. long, the leaves very few with long sheaths and very short laminæ.

The species is common in tropical Asia and Africa, and probably identical with some of the American forms.

3. **K. cylindrica,** *Nees; Kunth, Enum.* ii. 133.—Rhizome tufted or shortly creeping. Stems from 6 in. to above 1 ft. high, the leaves much shorter. Involucral bracts rather long, spreading or reflexed. Flower-heads or spikes oblong-cylindrical, 5 to 6 lines long when fully out, solitary or with a small globular head on each side. Spikelets 1-flowered, the larger glumes broader than in the other species, rather above 1 line long, nearly equal, the keel not very prominent, with 3 or 4 nerves on each side, the articulation usually immediately below the larger glumes leaving the lower smaller one more persistent on the base of the stipes or rhachis or falling off separately. Nut broad, black, nearly as long as the glumes.—Bœckel. in Linnæa, xxxv. 415.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*.

The specimens scarcely differ from the East Indian ones in the rather larger glumes. African specimens from Clarence Peak and Cameroon Mountains may also belong to the same species though the glumes are larger and more acuminate.

4. **K. triceps,** *Rottb. Ic. et. Descr. Pl.* 14, *t.* 4, *f.* 6.—Stems tufted, not creeping, but the rhizome at length rather thick and shortly horizontal, from 6 in. to about 1 ft. high. Leaves much shorter and narrow. Involucral bracts long and narrow. Spikes or flower-heads usually 3, the central one ovoid-oblong, about 4 lines long, the lateral ones shorter and globular and occasionally a fourth or a fifth globular flower-head in the same cluster. Spikelets 1-flowered, scarcely 1 line long, narrow, the upper glumes nearly equal, 5- or 7-nerved, the keel not much more prominent than the lateral nerves. Nut narrow-oblong, pale coloured, shorter than the glumes.—Kunth, Enum. ii. 133; Bœckel. in Linnæa, xxxv. 413.

Queensland. Cape River, *Bowman*; Rockhampton, *O'Shanesy*; N. Queensland, *Nernst*.

The species is widely spread over tropical Asia and Africa, and should probably include some of the American forms.

2. CYPERUS, Linn.

(Mariscus, *Vahl.* Papyrus, *Willd.* Diclidium, *Schrad.*)

Spikelets with several often numerous flowers rarely reduced to 3, 2, or 1, all hermaphrodite or the terminal flower rarely male. Glumes distichous, concave or navicular and keeled, all nearly equal and flowering except the lowest 2 or 1 usually smaller and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, deciduous, deeply or shortly divided into 2 or 3 filiform stigmatic branches or rarely almost or quite entire. Nut sessile, without any hypogynous disk, flattened biconvex or triquetrous, smooth or (frequently in the same species) minutely granular.—Perennials either tufted or forming horizontal or creeping rhizomes, rarely annuals. Stems simple under the inflorescence, Leaves few at the base of the stem or rarely covering it half way up with their sheaths, long or short or sometimes all reduced to the sheaths, of which the lower ones are scale-like covering the rhizome or leaving annular scars when they fall away. Spikelets in clusters heads or spikes, very rarely solitary at the ends of the rays or branches of a simple or compound irregular umbel, sometimes occupying the whole of the secondary rays, the central clusters or spikes always sessile in the centre of the umbel, the rays very unequal and sometimes the whole inflorescence contracted into a dense sessile compound cluster or head of spikelets, the general rhachis of the inflorescence rarely shortly produced, showing an interval between each ray. Under each ray is a persistent bract, one, two or more of the outer ones usually long and leaf-like forming an involucre round the inflorescence, the inner bracts and those which subtend the secondary rays and the spikelets usually small and scale-like, those under the spikelets rarely entirely wanting.

A very large and widely spread genus, second in the Order to *Carex* only in point of numbers, but much more prevalent than that genus in the tropical and subtropical regions both of the New and the Old World where it is everywhere abundant. It is represented also by a few species in more temperate regions, but quite disappears in the extreme north and south as well as on Alpine heights. Of the 61 Australian species only 30 are believed to be endemic or have not yet been identified out of the territory. Of the remaining 31, one is only known out of Australia in New Caledonia, 1 in Norfolk Island, 1 in New Zealand and South Africa, 1 in Africa, 9 are tropical Asiatic species which have not been ascertained to extend further, 10 are generally spread over the tropical regions of the Old World, 11 more tropical species common in the Old World are also in America, and, amongst those set down here as endemic in Australia or peculiar to the Old World, there are a few which are represented in America by closely allied if not absolutely identical species.

The genus differs from those groups of *Scirpus* which having no hypogynous bristles formed Brown's genus *Isolepis*, solely in the distichous arrangement of the glumes, and this character is not constant in *Cyperus pygmæus*, whilst in *Scirpus cyperoides* the glumes are often very nearly distichous. From *Schœnus* it is generally distinguished by the habit and inflorescence, the flowers more numerous in the spikelets, the flowering glumes more regularly distichous and the straighter rhachis of the spikelet, but none of these characters are absolutely constant. A few exceptional intermediates occur among the species of both genera.

SECT. I. **Pycreus.** *Spikelets flat with navicular keeled glumes. Style usually 2-cleft. Nut more or less flattened, with one edge next the rhachis.*

Nut ovate or obovate, not exceeding half the length of the glume.
  Dwarf tufted annual. Spikelets in loose clusters in an umbel of 3 to 6 rays. Keel of the glumes produced into a straight or recurved point, the sides nerveless . . . . 1. *C. pumilus.*
  Perennial mostly under 1 ft. Spikelets 1 to 1¼ lines broad, in a single loose cluster or rarely 1 or 2 short umbel-rays. Glumes broad, obtuse, the sides dark or with a dark patch . . . . 2. *C. eragrostis.*
  Annual or perennial much under 1 ft. Spikelets 1 to 1¼ lines broad, few in the clusters in an umbel of few rays or all in one cluster. Glumes broad, obtuse, very pale or yellowish green . . . . . 3. *C. flavescens.*
  Perennial, mostly under 1 ft. Spikelets narrow, in heads or clusters all sessile or in an umbel of few rays. Glumes rather narrow, almost acute, the sides of a pale brown. . . . . 4. *C. globosus.*
  Perennial, 1 to 2 ft. Spikelets 2 lines broad, the clusters in an umbel of few rays. Glumes broad, rather acute, shining green or yellowish . . . . 5. *C. unioloides.*
Nut oblong, not exceeding half the length of the glume.
  Spikelets narrow, very numerous, in a dense sessile compound cluster, rarely with 2 or 3 elongated umbel-rays. . . . . 6. *C. polystachyus.*
Nut broad, almost as long as the glume. Tall perennial.
  Spikelets loosely spicate and distichous along the rays of a large compound umbel . . . . 7. *C. flavicomus.*

SECT. II. **Juncellus.** *Spikelets flattened but usually thick. Style 2-cleft or rarely 3-cleft. Nut ovate or broad, with a flat or concave face next the axis, the back convex or with a raised central angle.*

Spikelets very numerous and closely packed in a small compound head with an involucre of long leafy bracts.
  Dwarf annual. Involucre of several bracts. Pericarp not thickened . . . . 8. *C. pygmæus.*
  Perennial, often 1 ft. high. Involucre of 2 very long bracts. Pericarp thickened at the base into a white prominent 2- or 3-lobed mass . . . . 9. *C. cephalotes.*
Spikelets few, in a single cluster, apparently lateral, the involucral bract continuing the stem . . . . 10. *C. lævigatus.*
Spikelets in clusters in a dense umbel of several short rays. Style hairy . . . . 11. *C. platystylis.*
Spikelets small numerous, in dense spikes along the rays of a large compound umbel. Stems 3 to 4 ft. . . 12. *C. alopecuroides.*

SECT. III. **Eucyperus.** *Spikelets flat, the rhachis not winged or rarely with an exceedingly narrow border. Style 3-cleft. Nut equally triquetrous.*

Spikelets numerous, in a single small dense globular head, with an involucre of long slender bracts. . . . . 13. *C. pulchellus.*
Spikelets spreading, pale-coloured, in a single sessile cluster or solitary. Glumes obtuse or very shortly pointed. Nuts short. (**Graciles**).
  Annual not exceeding 2 in. Spikelets 1 or 2 apparently lateral, one involucral bract continuing the stem . 14. *C. tenellus.*

Slender perennials. Spikelets or clusters terminal.

Glumes with 3 or 4 prominent nerves on each side and scarcely any nerveless margins . . . . . . 15. *C. gracilis.*

Glumes with 1 or 2 nerves on each side near the keel and broad nerveless margins. Leaves almost filiform.

Spikelets clustered. Nuts more than half the glume 16. *C. enervis.*

Spikelets solitary or 2 together. Nuts scarcely half the glume . . . . 17. *C. debilis.*

Glumes with 1 nerve on the middle of each side. Leaves linear, often 1 line broad . . . . 18. *C. lævis.*

Spikelets numerous, clustered or capitate, the clusters or heads solitary or in an umbel of few rays. Glumes with a prominent straight or recurved point. Small annuals (**Squarrosi**).

Keel of the glumes ending in a short slightly recurved point, with a nerve on each side. Nuts narrow . 19. *C. castaneus.*

Keel of the glumes ending in a long recurved point, the sides nearly nerveless. Nuts rather broad . 20. *C. cuspidatus.*

Glumes 3- or 5-nerved, tapering into a long recurved point, without nerveless margins. Nuts broad . 21. *C. squarrosus.*

Spikelets dark-coloured, clustered or capitate in an umbel of few rays or the clusters rarely solitary. Nuts broad, as long as the glume (**Nigricantes**).

Spikelets small and numerous in dense globular heads. Glumes orbicular not ½ line long . . . . 22. *C. difformis.*

Spikelets spreading, in clusters of 3 to 6. Glumes above 1 line long . . . . 23. *C. tetraphyllus.*

Spikelets pale or brown, clustered capitate or solitary on the rays of an umbel. Nuts broad, not above ½ the glume (except *C. filipes*) (**Compressi**).

Involucral bracts few, unequal, 1 or 2 longer than the inflorescence or all short.

Umbel-rays few. Stems weak. Spikelets oblong. Glumes acutely keeled, with 1 nerve in the middle of each side . . . . 24. *C. trinervis.*

Umbel-rays numerous.

Stems erect, very angular or flat. Spikelets small, linear, acute . . . . 25. *C. Haspan.*

Stems erect, leafy at the base. Spikelets very flat, ovate or oblong. Glumes brown with white edges . . . . 26. *C. concinnus.*

Involucral bracts 6 or more long leafy and unequal. Umbel rays long numerous and slender.

Spikelets solitary on each ray . . . . 27. *C. filipes.*

Spikelets in clusters of 3 or 4 on each ray . . . . 28. *C. pedunculosus.*

Involucral bracts about 6, nearly equal, rigid, erect or spreading. Umbel many-rayed or reduced to a dense cluster. Stem leafless . . . . 29. *C. vaginatus.*

Spikelets pale or dark brown, clustered on the rays of an umbel. Nut narrow, nearly or quite as long as the glume (**Fulvi**).

Spikelets small and few-flowered, in little globular clusters in a compound umbel . . . . 30. *C. holoschœnus.*

Spikelets very flat, long and narrow linear, clustered in a compound umbel. Glumes mostly obtuse . . 31. *C. dactylotes.*

Spikelets very flat, linear, clustered in a simple umbel or compound cluster. Glumes tipped with fine points . . . . 32. *C. Gilesii.*

Spikelets rather thick, oblong or lanceolate. Glumes obtuse or scarcely acute. Stems obtusely triquetrous.

Spikelets 8 to 12-flowered. Glumes imbricate though rather loose . . . . 33. *C. fulvus.*

Spikelets 10 to 30-flowered. Glumes spreading scarcely imbricate . . . . 34. *C. carinatus.*

Spikelets of *C. carinatus.* Stems stout, acutely 3-angled. Involucral bracts 1 or 2 very long and scabrous . . . . 35. *C. alterniflorus.*

Spikelets usually numerous, in loose spikes along the rays of a simple or compound umbel (**Ornati**).

Spikelets flat, usually pale, the rhachis of the spike minutely hairy . . . . 36. *C. pilosus.*

Spikelets flat, of a rich brown. Glumes bordered by a scarious hyaline membrane . . . . 37. *C. ornatus.*

Spikelets flat, pale brown or yellowish green, very irregularly spicate. Glumes very obtuse, loosely imbricate . . . . 38. *C. Iria.*

Spikelets flat, pale, densely spicate. Glumes loosely imbricate, the keel produced into a short point . . 39. *C. eleusinoides.*

Spikelets very narrow-linear, loosely spicate and spreading, the glumes very narrow and distant . 40. *C. distans.*

Sect. IV. **Papyrus.**—*Spikelets flat or terete, the rhachis bordered by scarious wings, either persistent or at length more or less detached as small scales. Glumes imbricate. Style* 3-*cleft. Nut equally triquetrous.*

Spikelets shortly spicate or clustered on the rays of a simple or compound umbel. Nut not exceeding half the length of the glume (**Corymbosi**).

Stems leafless or the sheaths bearing a very short lamina.

Glumes concave, not at all or scarcely keeled. Nut more or less dorsally flattened . . . . . . 41. *C. tegetiformis.*

Glumes keeled. Nut equally triquetrous.

Stems transversely septate . . . . 42. *C. articulatus.*

Stems continuous . . . . 43. *C. diphyllus.*

Stems leafy at the base.

Spikelets rather flat, usually acute, shortly and rather loosely spicate or clustered . . . . . 44. *C. rotundus.*

Spikelets linear, very flat, densely clustered or shortly spicate . . . . 45. *C. stenostachyus.*

Spikelets slightly flattened, in very dense short spikes or clusters. Stems acutely 3-angled. Leaves rather broad with long points . . . . 46. *C. congestus.*

Spikelets very narrow, scarcely flattened, in dense clusters. Stems obtusely triquetrous. Leaves very narrow . . . . 47. *C. subulatus.*

Spikelets clustered or shortly spicate on the rays of a simple or campound umbel. Nut usually nearly as long as the glume (**Lucidi**).

Spikelets small, 5 to 8-flowered, in little globular clusters. Stems obtusely triquetrous . . . . . 48. *C. sporobolus.*

Spikelets linear, scarcely flattened, 10- to 20-flowered, in close clusters or heads.

Stems obtusely triquetrous. Spikelets usually few in the heads . . . . 49. *C. angustatus.*

Stems stout, acutely 3-angled. Spikelets numerous in the heads . . . . 50. *C. Novæ Hollandiæ.*
Spikelets flat, of a rich brown.
Spikelets in globular clusters or heads, usually 8- to 12-flowered . . . . 51. *C. Gunnii.*
Spikelets distinctly spicate, mostly 5- to 8-flowered . 52. *C. lucidus.*
Spikelets in lengthened spikes along the rays of a compound or rarely simple umbel.
Spikelets flat. Glumes loosely imbricate. Nut more than half the length of the glume.
Spikelets pale-coloured, 10- to 16-flowered, the rhachis scarcely winged . . . . 39. *C. eleusinoides.*
Spikelets of a rich brown, 3 to 8-flowered, the rhachis distinctly winged . . . . 52. *C. lucidus.*
Spikelets flat. Glumes closely imbricate. Nut less than half the length of the glume (**Exaltati**).
Spikelets thick, 1½ to 2 lines broad, pale-coloured, 4- to 8-flowered . . . . 53. *C. pennatus.*
Spikelets very flat, under 1 line broad, usually rich brown, 10- to 20-flowered . . . . 54. *C. exaltatus.*
Spikelets narrow, linear-terete, 10- to 20-flowered. Nut less than half the length of the glume.
Spikelets densely crowded, ½ in. long or more. Glumes prominently 7- or 9-nerved . . . . . 55. *C. hæmatodes.*
Spikelets loosely spicate, mostly under ½ in. Glumes obscurely 3-nerved . . . . 56. *C. auricomus.*

Sect. V. **Diclidium.**—*Spikelets narrow, terete or nearly so, often flexuose, sometimes 1-flowered, the rhachis bordered by hyaline wings embracing the nuts. Flowering glumes distant, narrow, closely appressed to the rhachis. Style 3-cleft. Nuts triquetrous.*

Spikelets rather rigid, with 6 or more flowers, in elongated spikes in a large compound umbel . . . . . 57. *C. ferax.*
Spikelets almost subulate, with 6 or more flowers, in short close spikes in an umbel of few rays . . . . 58. *C. Bowmanii.*
Spikelets filiform, 3- or 4-flowered, in loose spikes in a large compound umbel . . . . 59. *C. trichostachys.*
Spikelets mostly 2- or 3-flowered, in ovoid globular spikes in a simple umbel of few rays. Stems smooth . . 60. *C. leiocaulus.*
Spikelets 1- or 2-flowered, in ovoid or cylindrical spikes in a compound umbel of many rays. Stems scabrous 61. *C. scaber.*

Sect. VI. **Mariscus.**—*Spikelets small, numerous, terete or scarcely flattened, 1- or 2-flowered, the short enclosed rhachis bordered by hyaline wings. Flowering glumes imbricate when more than one. Style 3-cleft. Nut triquetrous.*

Spikelet usually with 2 perfect flowers, in small globular clusters in a compound umbel of many rays . . . 62. *C. decompositus.*
Spikelets with 1 or rarely 2 perfect flowers, in loose cylindrical spikes in a compound umbel . . . . 63. *C. Armstrongii.*
Spikelets usually with 1 perfect flower, in dense cylindrical spikes either sessile or pedunculate in a simple umbel . . . . 64. *C. umbellatus.*
Spikelets usually with 1 perfect flower, in dense ovoid or 3-lobed heads in a simple umbel . . . . 65. *C. conicus.*

The following species have been supposed to be Australian by Kunth and Boeckeler, on the authority of specimens of Sieber's Agrostotheca, which however all prove to be West Indian.

Mariscus parviflorus, Nees in Sieb. Agrostoth., n. 101=*Cyperus luzulæ*, Rottb.

Cyperus microcephalus, Nees in Sieb. n. 103 (*C. Sieberianus*, Spreng. Syst. Cur. Post. 29).=*C. surinamensis*, Rottb.

Carex Sieberi, Nees in Sieb. n. 101 (*Mariscus rigidus*, Spreng. Syst. Cur. Post. 29) =*Cyperus flavus*, Bœckel. (*Mariscus flavus*, Vahl).

Cyperus ligularis, Linn.; Sieb. Agrostoth. n. 106.

C. spectabilis, Schreb.; Kunth, Enum. ii. 73, was published as an Australian plant on the authority of one received at the garden of Erlangen from the Jardin des Plantes at Paris under the name of *C. Paramatta*, Mart. No such name occurs in the Catalogues of the Jardin, and Bœckeler in Linnæa, xxxv. 605, identifies the plant with a Mexican species.

SECTION 1. PYCREUS, Nees.—Spikelets several-flowered, flat with navicular keeled glumes, the rhachis not winged or with a narrow border. Style usually 2-cleft. Nut more or less flattened, with one edge next the rhachis.

The section is a somewhat artificial one, the first five species having the habit of some of the *Compressi*, the *C. polystachyus* often resembling the *C. rotundatus*, and the *C. flavicomus* has the habit of *C. procerus*.

1. **C. pumilus**, *Linn.; Kunth, Enum.* ii. 4.—A dwarf tufted annual, the stem seldom above 3 or 4 in. high, the leaves mostly shorter and narrow. Umbel simple or slightly compound, of 3 to 6 slender rays, the longest 1 to 2 in. long, besides the sessile clusters. Spikelets 6 to 12 together, in loose clusters or short spikes. Involucral bracts generally 3, of which 1 or 2 longer than the inflorescence. Spikelets resembling those of *C. cuspidatus*, linear-lanceolate, very flat, rather acute, brown, 3 to 4 lines long and under 1 line broad, 16- to 20-flowered, the rhachis not winged. Glumes spreading, loosely imbricate or rather distant, the green keel with a prominent nerve on each side, produced into a short spreading or longer and recurved point, the brown scarious nerveless sides ending obtusely below the point. Stamens 2 or sometimes 1 only. Style 2-cleft. Nut obovate, biconvex, with one edge next the rhachis, less than half the length of the glume. —*C. nitens*, Vahl; Bœckel. in Linnæa, xxxv. 483; *C. breviculmis*, F. Muell. Fragm. viii. 267, not of R. Br.

Queensland. Port Denison, *Fitzalan;* Rockhampton, *O'Shanesy.*

The species is widely spread over tropical Asia and Africa. Bœckeler is evidently right in uniting as one species the first five of Kunth's *Cyperi*, described under the names of *C. hyalinus*, *C. nitens* and *C. membranaceus*, Vahl, *C. punctatus*, Roxb. and *C. pumilus*, Linn. The Australian specimens belong to the var. *patens*, Bœckel. (*C. patens*, Vahl, not seen by Kunth), with looser spikes and rather narrower spikelets than in the commoner East Indian forms.

2. **C. eragrostis,** *Vahl; Kunth, Enum.* ii. 7.—A perennial, flowering perhaps sometimes the first year, but forming short slender creeping or ascending rhizomes, and sometimes with the short tufted aspect of *C. flavescens*, differing from that species chiefly in the colour of the glumes. Stems mostly 6 in. to about 1 ft., high. but sometimes shorter or longer. Leaves shorter than the stem, all radical or extending nearly half way up. Spikelets either very few in a sessile cluster, or more numerous in a compound cluster or with 1 or 2 slightly elongated umbel rays each bearing a cluster. Involucre of 2 to 4 narrow bracts, 1 or 2 much longer than the inflorescence. Spikelets flat, dark brown

or almost black, oblong or broadly linear, 3 to 6 lines long and about 1 line broad with about 12 to 24 flowers, the rhachis not winged. Glumes loosely imbricate, rather spreading, broad, obtuse, with a more or less marked greenish keel, the sides nerveless, either a rich brown with narrow hyaline margins, or hyaline with a dark brown patch. Stamens usually 2. Style 2-cleft. Nut obovate, but varying much in breadth, biconvex or nearly flat, one edge next to the rhachis, less than half the length of the glume.—Bœckel. in Linnæa, xxxv. 443; F. Muell. Fragm. viii. 260; *C. areolatus*, R. Br. Prod. 216.

Queensland. Brisbane River, *Bailey;* Boyne River, *Hartmann.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, *Mrs Calvert;* New England, *C. Stuart;* Richmond River, *C. Moore*, *Mrs. Hodgkinson.*
Victoria. Mount Aberdeen and Buffalo Range, *F. Mueller;* and a dwarf form 1 to 2 in. high, Mitta-Mitta and Upper Hume Rivers, *F. Mueller.*
S. Australia. Torrens River, *F. Mueller.*

The species is widely distributed over East India, extending on the one hand to west tropical Africa, and on the other, more sparingly, to the Malayan Archipelago. Among the Indian forms Bœckeler distinguishes the larger ones with the elongated leafy stems rooting at the base under the name of *C. atratus*, Bœckel. in Linnæa, xxxv. 446, but the two forms are too much connected in Australia as in India by intermediates to be specifically separated. The South African *C. Mundtii*, Kunth, has been sometimes, but erroneously referred to this species. *C. nitidus*, Lam. Illustr. i. 115, founded on an East Indian plant described and figured by Rottboell, Ic. et Descr. Pl. 29, t. 9, f. 4, is however evidently the larger form of *C. eragrostis*, and not the African *C. laneeus*, to which Bœckeler, Linnæa, xxxv. 462, refers it on the authority of a specimen in Vahl's herbarium said to come from Lamarck, but which cannot be considered as authentic. In this uncertainty it could only produce confusion to adopt Lamarck's older name for either species.

3. **C. flavescens,** *Linn.; Kunth, Enum.* ii. 5.—In the typical Mediterranean form usually a small tufted annual, but even there said by some to be perennial and, in the Australian specimens referred to it with some doubt, perhaps perennial and above 6 in. high. Leaves narrow, much shorter. Spikelets few together or rarely more numerous, in clusters in a simple umbel of 3 or 4 rays, or the whole reduced to a sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 much longer than the inflorescence and narrow. Spikelets oblong or broadly linear, obtuse, flat, 3 to 4 lines long when fully out and 1 line or rather more broad, of a shining yellowish green when fresh, pale in the dried specimens, 12- to 20-flowered, the rhachis not winged. Glumes very obtuse and rather broad, with 3 or 5 nerves closely adjoining in a broad dorsal keel, the sides nerveless. Stamens said to be 3, but certainly 2 only in the upper or nearly all the flowers of several specimens. Style 2-cleft. Nut flat, ovate, with one edge next the rhachis, about half the length of the glume.—Sibth. Fl. Gr. t. 47; Host. Gram. iii. t. 72; Reichb. Ic. Fl. Germ. t. 278; Bœckel. in Linnæa, xxxv. 438.

N. S. Wales, *Woolls;* Bowen Downs, *Birch.*

The typical form belongs to the Mediterranean region and chiefly to its western portion, but there are tropical African, Mascarene and a few East Indian specimens which, like the Australian ones above mentioned, appear to be referable to the true

C. flavescens rather than to the *C. globosus*. It is possible however that the Australian ones may prove to be an anomalous form of *C. eragrostis* without the dark colour, on the glumes, and Sieber's specimens, Agrostotheca, n. 105, are not Australian. The Brazilian *C. Olfersianus*, Kunth, is scarcely to be distinguished from the typical *C. flavescens*, and some of the North American annual digynous species are very near to it.

4. **C. globosus,** All.; *Bœckel. in Linnæa*, xxxv. 458.—A tufted perennial, the stems from under 6 in. to above 1 ft. high. Leaves shorter, very narrow, sometimes almost setaceous, the lower sheaths often broad. Spikelets 3 or 4 together or frequently more numerous, in clusters in an umbel of 3 to 6 rays, either all short or the outer ones 1 to 2 inches long, or the whole reduced to a single sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, flat, rather acute, pale or dark brown, from 4 to 6 lines long and scarcely 1 line broad, 12- to 40-flowered, the rhachis not winged. Glumes rather narrow, obtuse or almost acute, the keel pale-coloured, faintly 3-nerved, the sides brown, nerveless, sometimes with a light-coloured margin. Stamens usually 2. Style 2-cleft. Nut obovate or almost orbicular, biconvex, one edge next the rhachis, much less than half the length of the glume.—Reichb. Ic. Fl. Germ. f. 279; *C. vulgaris*, Sieb. in Kunth, Enum. ii. 4; F. Muell. Fragm. viii. 260; *C. flavescens*, Thw. Enum. Ceyl. Pl. 342, and other Indian authors.

Queensland. Lockyer and Brisbane Rivers, *Hartmann*.
Victoria. Upper Humo River, *F. Mueller*.

The species is widely distributed over tropical and temperate Asia, extending to the Mediterranean region, and is also in east tropical Africa and the Mascarene Islands. It has been united by Thwaites with the *C. flavescens*, and certainly a few Indian specimens appear to connect the two, but generally speaking it seems very distinct in its taller more perennial stature, narrower more acute darker-coloured spikelets, and especially in the narrow glumes with brown sides. The Victorian specimens with dark-coloured spikelets come very near to the Indian *C. Junghuhnii* Miq., reduced by Bœckel. in Linnæa, xxxv. 458, to *C. nilagiricus*, Hochst., but the latter appears to be a variety only of *C. globosus*.

5. **C. unioloides,** *R. Br. Prod.* 216.—A perennial, tufted or with a short creeping rhizome. Stems 1 to 2 ft. high, triquetrous. Leaves flat but narrow, rather rigid, mostly shorter than the stem, with long brown sheathing bases. Umbel compound, of 3 to 6 rays, the longest 1 to 3 in. long, the spikelets 4 to 12 together in clusters or short loose spikes. Involucral bracts 2 to 4, 1 usually much longer than the inflorescence. Spikelets oblong-lanceolate or almost ovate, flat but rather thick, 4 to 8 lines long and about 2 lines broad, of a shining yellowish green or pale brown, 12- to 20-flowered, the rhachis not winged. Glumes broad, rather acute, with a prominent greenish keel, the sides smooth and nerveless. Stamens usually 3. Style 2-cleft. Nut broadly obovoid or orbicular, biconvex with one edge next the rhachis, much less than half the length of the glume.—*C. bromoides*, Willd. MS.; Kunth, Enum. ii. 8; *C. angulatus*, Nees; Bœckel. in Linnæa, xxxv. 465; *C. lanceus*, F. Muell. Fragm. viii. 259, not of

Thunb.; *C. luteolus*, Bœckel. in Flora, 1875, 82 (from the character given).

Queensland, Shoalwater Bay, *R. Brown;* Brisbane River, *F. Mueller.*
Victoria. Upper Hume River at an elevation of 3000 to 4000 ft., *F. Mueller.*

The species extends over Nepaul and the eastern provinces of India, it is also in Brazil and in South Africa, where however the true *C. lanceus*, Thunb., with more acute deep brown spikelets, is much more abundant.

6. **C. polystachyus,** *Rottb. Descr. et Ic. Pl.* 39, t. 11. f. 1.—A tufted perennial. Stems from under 1 ft. to above 2 ft. high, triquetrous but not very stout. Leaves narrow, much shorter than the stem, with short broad sheaths. Inflorescence usually crowded into a dense sessile head or cluster with numerous spikelets, but sometimes forming a loose irregular umbel approaching that of some varieties of *C. rotundus.* Involucral bracts 2 to 4, of which 1 or 2 longer than the inflorescence. Spikelets narrow-linear, flat, rather acute, 4 to 6 lines long and under 1 line broad, usually pale-brown, 20- to 30-flowered, the rhachis angular and often slightly winged. Glumes closely distichous, rather narrow, obtuse or with the keel produced into a short point, the sides indistinctly nerved. Stamens usually 2. Style 2-cleft or very rarely here and there 3-cleft. Nut narrow, biconvex, not half so long as the glume.—R. Br. Prod. 214; Kunth, Enum. ii. 13; Bœckel. in Linnæa, xxxv. 477; F. Muell. Fragm. viii. 265.

Queensland. Northumberland Islands, *R. Brown;* Sir C. Hardy Island, *Henne;* Cape York, *Daemel;* Rockingham Bay, *Dallachy;* Port Curtis, *M'Gillivray;* Brisbane River, Moreton Bay, *F. Mueller;* Rockhampton and various localities in S. Queensland, *Bowman*, and many others.
N. S. Wales. Port Jackson, *R. Brown, Woolls*, and others; New England, *C. Stuart;* Clarence River, *Beckler;* Richmond River, *C. Moore.*

Var.? *laxiflora.* Spikelets loosely clustered, often stipitate and almost racemose or corymbose in an umbel of 6 to 10 slender rays, the longest often 2 to 3 in. long. Nut rather broader.—*C. aquatilis*, F. Muell. Fragm. viii. 270, not of R. Br.

N. Australia. Arnhem's Land, *F. Mueller.*
Queensland. Daintree River, *Fitzalan;* Rockingham Bay, *Dallachy.*

This variety has much resemblance with some of the looser flowered forms of *C. rotundus*, with small pale spikelets, but is readily distinguished by the style and nut. It may be a distinct species but is connected with the typical form by several Indian specimens. The species is common in the warmer regions of both the New and the Old World, extending northward to the Mediterranean and S. China in the Old World and to the Southern United States in America.

7. **C. flavicomus,** *Mich.; Kunth, Enum.* ii. 15.—A tall elegant perennial. Stems prominently 3-angled, 2 to 3 ft. high. Leaves much shorter, rather narrow. Umbel large and loose, often compound, the longer rays often 4 to 6 inches long, with numerous spikelets distichously spicate along the partial rays. Involucral bracts 3 or more, of which 1 or 2 much longer than the infloresence, and the lowest sometimes 4 or 5 lines broad. Spikelets spreading, lanceolate, flat, ½ to 1

in. long, and at length 2 lines broad, 12- to 20-flowered, the angles of the rhachis bordered by a narrow hyaline wing. Glumes spreading and quite distinct, giving the spikelet a pinnate appearance, broad, obtuse, the keel green, the sides smooth or pale and always bordered by a white hyaline margin. Stamens 3. Style 2-cleft. Nut broad, flat with one edge next the rhachis, nearly as long as the glume.—Bœckel. in Linnæa, xxxv. 470; *C. tremulus*, Poir.; Kunth, Enum. ii. 16; *C. Hochstetteri*, Nees; Bœckel. l. c. 471; *C. patuliflorus*, Bœckel. l. c. 473; *C. ornatissimus*, F. Muell. Fragm. viii. 265, ix. 54.

N. Australia. Head of Sturt's Creek, *F. Mueller;* Arnhem's Land, *M'Kinlay.*

The species is also in the Indian Peninsula, in tropical Africa and the Mascarene Islands, and in Mexico and the southern United States of North America and is nearly allied to the more common Indian *C. puncticulatus*, in which the glumes are more closely imbricate and have not the white border. The N. American specimens have usually smaller spikelets and glumes than the Indian and Australian, but some Mexican ones and others from tropical Africa (correctly referred to *C. flavicomus* by J. Gay), are quite as large as in some of the Australian specimens.

SECTION II. JUNCELLUS, Griseb.—Spikelets flattened but usually thick, with concave glumes, the rhachis not winged. Style 2-cleft or occasionally 3-cleft. Nut ovate or broad, with a flat or concave face next the rhachis, the back convex or with a raised central angle.

This section is fairly marked in character, but not very natural, the globose capitate inflorescence of the first two species is repeated in *C. pulchellus* and in *C. dubius* and some other Indian ones, the lateral inflorescence of *C. lævigatus* is exceptional in the genus, *C. alopecuroides* has the habit nearly of *C. exaltatus.*

8. **C. pygmæus,** *Rottb. Descr. et Ic. Pl.* 20, *t.* 14, *f.* 4, 5.—A densely tufted low annual, the stem usually under 6 in. high. Leaves mostly shorter and very narrow. Spikelets small and exceedingly numerous, densely crowded into a globular compound head not exceeding ½ in. diameter. Involucral bracts 2 or 3, embracing the head by a broad base, with leafy points of 1 to 3 in., and often a few of the inner bracts leafy and protruding more or less from the head. Spikelets flat, ovate or oblong, about 2 lines or in luxuriant specimens nearly 3 lines long and 1 to 1½ lines broad, 12- to 20- or even more-flowered without any empty glumes at the base, but subtended by a glume-like bract, the rhachis not winged. Glumes pale green, shortly acuminate, prominently keeled, the sides more or less hyaline. Stamens usually 1 only. Style 2-cleft or rarely 3-cleft. Nut ovate, shorter than the glume, the broad flat inner face next the rhachis, the back convex or, when the style is 3-cleft, with a dorsal raised angle. —Kunth, Enum. ii. 18; Bœckel. in Linnæa, xxxv. 493; F. Muell. Fragm. viii. 268.

N. Australia. Upper Victoria River and Flinders River, *F. Mueller;* Charlotte Waters in Central Australia, *Giles;* also in Mitchell district.

Queensland, *Mitchell.*

Victoria. Ovens River, *F. Mueller.*

The species is abundant in tropical and subtropical Asia and in the Mediterranean region, extending here and there into more temperate regions both in Europe and Asia, and reappearing in Mexico and Cuba. In Australia it retains the typical form with flat spikelets regularly distichous or the arrangement only here and there slightly disturbed. In the form the most frequent in the Mediterranean region, the spikelet assumes an irregular twist or the glumes are more or less arranged in 3 to 5 ranks, on which account it was referred by Linnæus to *Scirpus* under the name of *S. Michelianus* (*Isolepis Micheliana*, Kunth, Enum. ii. 203); but Bœckeler is probably right in regarding it as a variety only of *C. pygmæus*. Several Indian specimens appear to be quite intermediate. F. Muell. Fragm. ix. 7, includes under *Isolepis Micheliana* this species and the *Scirpus humillimus*, Benth.

9. **C. cephalotes**, *Vahl; Kunth, Enum.* ii. 48.—Stems from about 6 in. to above 1 ft. high. Spikelets small and numerous, densely crowded into a sessile globular or conical compound head about $\frac{1}{2}$ in. diameter. Involucral bracts with a lanceolate base, 2 or 3 very long often above 1 ft. Spikelets imbricate or at length spreading, pale coloured or varied with brown, flat, 2 to 3 lines long and 1 to $1\frac{1}{4}$ lines broad, 10- to 20-flowered, the short rhachis not winged. Glumes rather spreading, concave or navicular, obscurely several-nerved, the acutely prominent keel sometimes minutely ciliate. Stamens usually 2. Style undivided or unequally 2-cleft, rarely 3-cleft. Nut ovate, flattened, rather shorter than the glume, the broad inner face next the rhachis, the back convex, the lower part of the pericarp thickened into a white cellular mass projecting in 2 or 3 lobes up the angles of the upper thin seed-bearing part, and falsely described as an adnate perigynium. — *Anosporum monocephalum*, Nees; Bœckel. in Linnæa, xxxvi. 411; F. Muell. Fragm. viii. 272; *Cyperus Hookerianus*, Thw. Enum. Ceyl. Pl. 342.

Rockingham Bay, *Dallachy*. Rather widely spread over E. India.

The thickening of the base of the pericarp is a curious anomaly, occurring in a few species belonging to different groups of *Cyperus* and in one species of *Scirpus*, and being unaccompanied by any other character, cannot be of importance enough to retain the very artificial genus as proposed by Bœckeler.

10. **C. lævigatus,** *Linn.; Bœckel. in Linnæa,* xxxv. 486.—Rhizome usually creeping. Stems 6 in. to $1\frac{1}{2}$ ft. high, enclosed at the base in 2 or 3 brown sheaths, one of which is often produced into a short erect rigid leaf. Spikelets 6 to 12 together or sometimes only 2 or 3, in a sessile cluster apparently lateral, the longest of the 2 involucral bracts being erect and continuous with the stem. Spikelets in the normal and only Australian form of a pale green or almost white, lanceolate, or broadly linear, flat but rather thick, with a longitudinal groove on each face, 4 to 5 rarely 6 lines long, about 2 lines broad, with often above 30 flowers, the rhachis not winged. Glumes very closely imbricate, obtuse, broad and concave, the keel scarcely prominent and the nerves very faint. Style 2-cleft. Nuts broadly obovate or orbicular, flattened, the broad inner face next the rhachis, mostly about half the length of the glume.—Rottb. Descr. et. Ic. Pl. t. 16, f. 1; F. Muell. Fragm. viii. 266; *C. mucronatus*, Rottb. l. c. 19, t. 8, f. 4; Kunth, Enum. ii. 17; *Pycreus lævigatus,* Nees in Pl. Preiss. ii. 72.

W. Australia. Swan River, *Drummond*, *n.* 325, *Preiss*, *n.* 1808. Widely spread over the warmer regions both of the New and the Old World, chiefly in maritime districts. The Australian specimens have all the typical pale-coloured spikelets. In the Mediterranean region the *C. junciformis*, Cav., now generally recognised as a variety of *lævigatus*, with dark brown glumes more prominently keeled, is more common than the typical form, but is not in Australia.

11. **C. platystylis,** *R. Br. Prod.* 241—Stems tufted, rather stout, not above 1 ft. high. Leaves rather broad, shorter and mostly much shorter than the stem, with flattened acutely keeled sheaths. Umbel very compact, of about 6 rays, the longest under 1 in. Spikelets 6 to 12 in the clusters. Involucral bracts 1 or 2 longer than the inflorescence and one or two short. Spikelets brown, flat but rather thick, 4 to 6 lines long, 1½ lines broad, acute, the rhachis not winged. Glumes very regularly distichous and imbricate, broadly concave, the lower ones obtuse, the upper ones acute, the keel slightly prominent sometimes produced into a short point, the nerves very faint. Style 2- or 3-cleft, flattened or triquetrous in the upper part, the angles ciliate. Nut oblong or oval-oblong, as long as the glume, the flat face next the rhachis, the back convex.

N. S. Wales. Hawkesbury, *R. Brown.* The style is quite that of *Fimbristylis*, all the other characters those of *Cyperus.*

12. **C. alopecuroides,** *Rottb. Descr. et Ic. Pl.* 38, *t.* 8, *f.* 2.—Stems tufted at the base, stout and triquetrous, attaining 3 or 4 ft. Leaves shorter, rather numerous. Umbel large, compound but very irregular, the rays rigid, erect, the longer ones sometimes at least 6 in. long, sometimes all short and compact, the spikelets very numerous, and densely crowded all round the rhachis, in cylindrical spikes of 1 to 1½ in., occupying the whole or the greater part of the secondary rays. Involucral bracts several, the outer ones from a broad base sometimes 1 to 2 ft. long, rarely all shorter than the inflorescence. Spikelets lanceolate, not very flat, mostly about 2 lines long and under 1 line broad, pale-coloured, 8- to 12-flowered, or rarely longer with more flowers, the rhachis angular but not winged. Glumes broad, concave, with several not very prominent nerves, the keel prominent in the upper part only, and often produced into a short spreading point. Stamens 2 or rarely 3. Style 2-cleft, one branch often very short, rarely 3-cleft. Nut obovate, scarcely half the length of the glume, much flattened, the broad inner face next the rhachis, the back convex or with a raised central angle.—R. Br. Prod. 217; Kunth, Enum. ii. 19; Bœckel. in Linnæa, xxxvi. 321; F. Muell. Fragm. viii. 263.

Queensland. Shoalwater Bay, *R. Brown*; Gracemere, *O'Shanesy.*

An unnamed specimen in herb. R. Brown, in the next sheet to his *C. alopecuroides* and probably representing the *C. compositus*, R. Br. Prod. 217, appears to be the *C. alopecuroides* with the inflorescence not yet fully developed. The species extends over tropical Asia and Africa.

SECTION III. EUCYPERUS.—Spikelets flat, with navicular or rarely concave glumes usually keeled, the rhachis not winged or the angles rarely bordered by an exceedingly narrow hyaline margin. Style 3-cleft. Nut equally 3-sided, or rarely (in *L. tetraphyllus*) dorsally compressed.

13. **C. pulchellus,** *R. Br. Prod.* 213.—A small slender plant with the habit of *Kyllinga monocephala*, but probably annual. Stems rarely above 6 in. high. Leaves much shorter, few and narrow or almost setaceous. Spikelets numerous, in a dense globular sessile head 3 to 4 lines diameter. Involucral bracts usually 3, spreading or reflexed, two of them much longer than the head. Spikelets very flat, pale coloured, ovate, rarely above 1 line long and nearly as broad, 8- to 12-flowered, the rhachis not winged. Glumes rather narrow, concave, spreading, obtuse, almost hyaline, the keel slightly prominent and one faint nerve on each side. Stamens usually 1 only. Styles 3-cleft. Nut oblong, obtuse, obtusely triquetrous, not quite half as long as the glume.—F. Muell. Fragm. viii. 271; *Sorostachys kyllingioides*, Steud. Syn. Glum. ii. 71; *Cyperus sorostachys*, Bœckel. in Linnæa, xxxv. 588.

N. Australia. Arnhem Bay, *R. Brown*; Gulf of Carpentaria, *F. Mueller*.
Queensland. Beef Creek, *Leichhardt*; Gainsford, *Bowman*.

The species is also in East India and the Malayan Archipelago. It is very closely allied to *C. leucocephalus*, Retz.

14. **C. tenellus,** *Linn. f.; Kunth, Enum.* ii. 25.—A densely tufted annual, with filiform stems not exceeding 2 in. and sometimes not above ½ in. high. Leaves short and filiform. Spikelets solitary or 2 or 3 together, apparently lateral, one involucral bract erect and continuous with the stem, a second one usually very short. Spikelets very flat, pale coloured, oblong, 2 to 3 lines long, rather above 1 line broad, 10- to 20-flowered, the rhachis not winged. Glumes rather broad, spreading, obtuse or very shortly and obtusely acuminate, prominently keeled, with 2 to 4 nerves on each side, and rather broad whitish nerveless margins. Stamens 1 or 2. Style 3-cleft. Nut elliptical, prominently 3-angled, more than half the length of the glume.—F. Muell. Fragm. viii. 261; *C. minimus*, Thunb.; Bœckel. in Linnæa, xxxv. 523, not of Linn.

N. S. Wales. Paramatta, *Woolls*.
W. Australia. *Drummond, n.* 222 *and* 366.

The species is also in New Zealand and in South Africa, it is well figured in Pluken. Almag. t. 300, f. 4 and represented in the Linnean herbarium by an authentic Cape specimen. *C. modestulus* Steud. Syn. Glum. ii. 16 from King George's Sound, *D' Urville*, which I have not seen, is from the character given probably the same species.

15. **C. gracilis,** *R. Br. Prod.* 213.—Stems tufted, very slender, from under 6 in. to nearly 1 ft. high. Leaves filiform, shorter than the stem, with short brown sheaths. Spikelets usually 2 to 4 or rarely more together in a sessile terminal cluster or head. Involucral bracts usually

3, filiform slightly dilated at the base, the longest attaining several inches. Spikelets flat, oblong-lanceolate, 2 to 3 lines long, rather above 1 line broad, of a pale brown or green, with 8 to 12 or rarely more flowers, the rhachis not winged. Glumes rather broad, somewhat acute and rather spreading at the point, with 3 or 4 prominent nerves on each side and scarcely any nerveless margins. Stamens usually 3. Style 3-cleft. Nut broad, prominently 3-angled, not much shorter than the glume.—F. Muell. Fragm. viii. 264.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy;* Dawson River, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, Agrostoth. n.* 23, *Woolls* and others; Clarence River, *Wilcox.*

Var? *rigidella.* Leaves not so slender and rather more rigid.—Head of Boyd River, *Leichhardt;* Lake Eyre, *Andrews.*

F. Mueller is disposed to unite the three following species with *C. gracilis,* which is also in New Caledonia. It is nearly allied to the common tropical *C. compressus,* but to no other American species in our collections. The *C. simplex,* H. B. and K. (*C. umbrosus,* Lindl.) is much nearer to *C. filipes* and *C. peduncularis.*

16. **C. enervis,** *R. Br. Prod.* 213.—Stems tufted, slender, from under 6 in. to nearly 1 ft. high, with filiform leaves as in *C. gracilis.* Inflorescence the same except that the spikelets are rather more numerous and rather longer with 12 to 16 flowers. Glumes broad, loosely imbricate but not spreading, obtuse or the keel produced into a very short straight point, with 1 or rarely 2 prominent nerves on each side of the keel, the broad sides otherwise nerveless. Nut as in *C. gracilis* not much shorter than the glume.

Queensland. Rockingham Bay, *Dallachy;* East Coast, *R. Brown;* Brisbane River, *herb. F. Mueller.*

N. S. Wales. Blue Mountains, *Woolls;* Clarence River, *Beckler, Wilcox;* New England, *C. Stuart;* Macleay River, *C. Moore;* Richmond River, *Mrs. Hodgkinson;* near Bulli, *Johnson.*

Var. *laxus,* the lateral spikelets sometimes pedunculate.—New England, *C. Stuart.*

17? **C. debilis,** *R. Br. Prod.* 213.—A slender tufted plant with setaceous leaves and involucral bracts, closely allied to *C. gracilis* and *C. enervis,* and possibly a variety of the latter. Spikelets solitary or rarely 2 together, very much like those of *C. enervis.* Glumes rather broad, with 1 or very rarely 2 nerves on each side of the keel and a rather broad nerveless margin. Nut broad, much shorter than the glume, acutely or at length obtusely 3-angled, more or less distinctly marked with fine longitudinal striæ.

N. S. Wales. Hawkesbury, *R. Brown;* Clarence River, *Beckler;* also in *Leichhardt's* and in *Woolls's* collections.

In Brown's specimens the spikelets are constantly solitary, the nuts not half the length of the glumes and striate only under a strong lens; in Beckler's the spikelets are often two together, the nuts at least half the length of the glumes and more prominently striate; Leichhardt's and Woolls's are similar but the glumes rather more striate.

18? **C. lævis,** *R. Br. Prod.* 213.—Not so slender as *C. enervis.* Stems 1 ft. high or rather more, acutely triquetrous. Leaves often above 1 line broad, with thickened nerve-like edges or inflexed margins. Spikelets 6 to 8 or more in a dense sessile cluster, spreading, pale coloured, flat, 3 to 4 lines long and about 1 line broad when fully out, 10- to 20-flowered, the rhachis not winged. Glumes spreading, rather broad, the keel prominent and sometimes produced into a very short point, the sides nerveless and sometimes with a dark spot or with a not very prominent nerve in the centre as in *C. trinervis.* Stamens 2 or 3. Style 3-cleft. Nut ovoid-triangular, about half the length of the glume.

N. S. Wales. Port Jackson, *R. Brown;* Maroochie River, *Bailey.*

I have seen but very few specimens of this species which may possibly prove to be a variety of *C. trinervis* with the inflorescence of *C. enervis*, but the habit is somewhat different from both.

19. **C. castaneus,** *Willd.; Kunth, Enum.* ii. 21.—A small tufted annual, the stems rarely above 4 in. high and sometimes under 1 in. Leaves setaceous, shorter or rarely longer than the stem. Spikelets numerous, in dense clusters either solitary and sessile, or 2 or 3 lateral ones on peduncles or umbel-rays of ½ to ¾ in. Involucral bracts 2 to 4, setaceous, mostly longer than the inflorescence. Spikelets linear, flat, of a rich brown, 4 to 6 lines long and scarcely above ½ line broad, about 12- to 20-flowered, the rhachis not winged. Glumes rather narrow, the very prominent keel produced into a recurved point, shorter however than in the two following species, with a more or less distinct nerve on each side, the sides or marginal appendages nerveless, brown, terminating often abruptly below the recurved point. Stamen usually 1. Style 3-cleft. Nut narrow-oblong, obtusely 3-angled, more than half the length of the glume.—Bœckel. in Linnæa, xxxv. 496; *C. squarrosus* var. *stenocarpus*, F. Muell. Fragm. viii. 262.

Queensland. Dry Beef Creek, *Leichhardt.*

The species is in the East Indian Peninsula, in Ceylon and in Sikkim, and scarcely distinct from the *C. aureus*, H. B. and K., which is widely spread over the tropical regions of the New and the Old World.

20. **C. cuspidatus,** *H. B. et K.; Kunth, Enum.* ii. 22.—A small tufted annual, resembling *C. castaneus* and *C. squarrosus* in habit, but the clusters of spikelets not so dense, and the glumes different. Stems mostly 2 to 4 in. long. Leaves very narrow or setaceous, sometimes as long as or longer than the stem. Clusters of spikelets solitary and sessile or in an umbel of few rays. Involucral bracts 2 or 3 longer than the inflorescence. Spikelets linear, spreading, from a pale green to a rich brown, 3 to 6 lines long, scarcely above ½ line broad, with 12 to 20 or even more flowers, the rhachis not winged. Glumes rather narrow, prominently 3-nerved, the keel or dorsal nerve produced into a long recurved or spreading point, the sides bordered by a nerveless brown or hyaline margin terminating often abruptly below the recurved

point. Stamen usually 1. Style 3-cleft. Nut obovoid but narrower than in *C. squarrosus*, prominently 3-angled.—Bœckel. in Linnæa, xxxv. 496; *C. squarrosus*, F. Muell. Fragm. viii. 262 but not of Linn., and not the var. *stenocarpus*.

Queensland. King's Creek and Herbert Creek, *Bowman.*

The species is widely spread over tropical Asia and Africa, extending northwards to S. China, and is also abundant in South and Central America east of the Andes.

21. **C. squarrosus,** *Linn. Amœn. Acad.* iv. 303 *and Spec. Pl.* 66 *excl. syn. Pluken.*—A small tufted annual, the stem rarely above 4 in. and sometimes under 1 in. high. Leaves mostly shorter than the stem, in some specimens $1\frac{1}{2}$ lines broad and tapering to a fine point, in others very narrow from the base. Spikelets numerous, in dense ovoid or globose heads either solitary and sessile or in an umbel of few rays, rarely 1 in. long. Involucral bracts 3 or 4, of which 1 or 2 much longer than the inflorescence. Spikelets flat, oblong or linear, 2 to 3 lines long, 10- to 20-flowered, the rhachis not winged. Glumes rather narrow, 5- or 7-nerved, tapering into a long recurved point, without any or scarcely any nerveless margin. Stamen usually 1. Style 3-cleft. Nut narrow-obovoid or oblong, prominently 3-angled, varying from rather broad and under half the length of the glume, to narrow and longer than the half.—*C. aristatus*, Rottb. Descr. et Ic. Pl. 23, t. 6, f. 1; Kunth, Enum. ii. 23; Bœckel. in Linnæa, xxxv. 500; *C. inflexus*, Muehl.; Kunth, l. c. 22; F. Muell. Fragm. viii. 262; *C. uncinatus*, R. Br. Prod. 215; *C. Brownei*, Steud. Syn. Glum. ii. 53.

N. Australia. Dampier's Archipelago, *Walcott*; Gulf of Carpentaria, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander*; various localities in North Queensland, *Armitage, Wuth*; beyond Mount Murchison, *Bonney.*
South or Central Australia. Charlotte Waters, *Giles.*

Var. *congestus.* Spikelets few-flowered, very densely crowded in nearly globular heads.—Dry Beef Creek, *Leichhardt.*

Var. *cylindraceus.* Spikelets 3- to 6-flowered, in dense oblong-cylindrical heads under $\frac{1}{2}$ in. long.—*C. aristatus*, F. Muell. Fragm. viii. 261.—Port Denison, *herb. F. Mueller*; Rockhampton and Herbert's Creek, *Bowman.*

The species is widely spread over East India, tropical Africa, North America and Mexico, extending down the Pacific side of the Andes to Chile, but not in South America east of the Andes. It was very well characterised by Linnaeus and is represented by a good specimen in his herbarium. Unfortunately he added a reference to Plukenet which belongs to a very different plant with the narrow somewhat flexuose spikelets and winged rhachis of the *Papyrus* section. This species, of which a small fragment is laid down in herb. Linn. by the side of the true *C. squarrosus*, is the *C. maderaspatanus*, Willd. described as *C. squarrosus* by Rottboell, Kunth, Bœckeler and others. It is common in India but not yet found in Australia.

22. **C. difformis,** *Linn.*; *Kunth*, *Enum.* ii. 38.—Stems tufted, 6 in. to $1\frac{1}{2}$ ft. high, rather slender. Leaves sometimes as long as the stem but usually shorter, and sometimes all reduced to loose sheaths. Spikelets very numerous, in dense globular heads of $\frac{1}{4}$ to $\frac{1}{2}$ in. diameter, the heads in a loose umbel of few rays, rarely contracted into a compound cluster, the rays usually slender. Involucral bracts 1, 2 or 3, very

variable in breadth. Spikelets narrow-linear, flat, 1½ to 2 lines long, remarkable for the numerous very small almost orbicular and very obtuse glumes, at first of a rich brown, but becoming variegated by their pale or almost white margins, the rhachis not winged. Stamens 1 or 2. Style 3-cleft. Nut obovoid, acutely 3-angled, as long as the glume or nearly so.—Rottb. Descr. et Ic. Pl. t. 9, f. 2; Sibth. Fl. Gr. t. 46; Reichb. Ic. Fl. Germ. t. 284; Bœckel. in Linnæa, xxxv. 586; R. Br. Prod. 215; F. Muell. Fragm. viii. 262.

Queensland. Keppel Bay, *R. Brown;* Rockingham Bay, *Dallachy;* Rockhampton, *Bowman, Thozet, O'Shanesy* and others; Moreton Bay, *F. Mueller, Leichhardt* and others; beyond Mount Murchison, *Bonney.*
N. S. Wales. Grose River, *R. Brown;* in the interior *A. Cunningham;* New England, *C. Stuart;* Clarence River, *Wilcox.*
Victoria? Murray River, *F. Mueller.*
South or Central Australia. Charlotte Waters, *Giles.*

Widely spread over the tropical and subtropical regions of the Old World, extending northwards to the Mediterranean region, where however it is rare and generally replaced by the nearly allied *C. fuscus.*

23. **C. tetraphyllus,** *R. Br. Prod.* 214.—Stems tufted or from a creeping rhizome, rather slender but usually rigid, triquetrous, 1 to 1½ ft. high. Leaves shorter or longer, flat, obtuse or acute, but less contracted into a point than in most species. Spikelets in clusters of 3 to 6, in an umbel of few or rarely rather numerous rays, the longest 2 to 3 in., rarely reduced to a single cluster. Involucral bracts narrow and tapering into long points, 1, 2 or 3 much longer than the inflorescence. Spikelets almost black but variegated with white when the nuts show beyond the glumes, linear-lanceolate, more or less flattened, 3 to 6 lines long, about 1 line broad, 6 to 20-flowered, the rhachis not winged. Glumes rather broad, concave, faintly several-nerved, obtuse or the keel prominent in the upper part only and produced into a very short point. Stamens usually 3. Style 3-cleft. Nut broad y triangular, more or less dorsally compressed, as long as the glume and at length protruding on each side.—Kunth, Enum. ii. 27; Sieb. Agrostoth. n. 22; F. Muell. Fragm. viii. 264.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Leichhardt, C. Stuart* and many others.
N. S. Wales. Hunter's and Paterson's River, *R. Brown;* Newcastle, *Leichhardt;* New England, Hastings, Tweed, Macleay, Clarence, and Richmond Rivers, *C. Moore, Beckler, C. Stuart* and others.

Var. *monocephalus.* Inflorescence reduced to a single sessile simple or compound cluster of spikelets.—Hastings and Macleay Rivers, *C. Moore.*

24. **C. trinervis,** *R. Br. Prod.* 213.—A perennial or sometimes annual. Stems weak and slender, from under 6 in. to 1 ft. long below the inflorescence. Leaves flat but not above 1 line broad, the longest often nearly as long as the stem, but sometimes all reduced to sheathing scales with or without a very short lamina. Spikelets in clusters of 3 or 4 or rarely more, in a simple or irregularly compound umbel of a few slender

rays, the longest sometimes 4 to 6 in. long, sometimes all under 1 in. or the inflorescence reduced to a sessile compound cluster. Involucral bracts usually 3, of which 1 or 2 longer than the inflorescence, but sometimes all short. Spikelets linear or oblong, very flat, pale coloured, in some specimens 2 to 3 lines long and 8- to 12-flowered, in others lengthening to 6 to 9 lines with numerous flowers, and at length appearing pedicellate from the fall of the lower glumes, usually about 1 line broad or rather more, the rhachis not winged. Glumes rather broad, short, regularly spreading, giving the spikelet a pinnate appearance, more or less acuminate, the keel acutely prominent, with 1 more or less conspicuous nerve in the middle of each side. Stamens 2 or 3. Style 3-cleft. Nut rather broad, acutely or at length obtusely 3-angled, not half so long as the glume.—Bœckel. in Linnæa, xxxv. 503; *C. flaccidus*, R. Br. l. c.; Bœckel. l. c. 502; F. Muell. Fragm. viii. 267; *C. imbecillis*, *C. aquatilis*, *C. inundatus* and *C. breviculmis*, R. Br. l. c. 213, 214; *C. Lessonianus* and *C. macellus*, Kunth, Enum. ii. 29, 30, according to Bœckeler.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* M'Adam Range and Fitzmaurice River, *F. Mueller;* Port Darwin, *Schultz, n.* 313 (scarcely in flower, and therefore doubtful); between Norman and Gilbert Rivers, *Gulliver.*

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham;* Shoalwater Bay, *R. Brown;* Rockingham Bay, *Dallachy;* Lizard Island, *M'Gillivray;* Rockhampton and numerous localities in S. Queensland, *Thozet*, *Bowman*, *Leichhardt*, *F. Mueller* and many others.

N. S. Wales. Hunter's River, *R. Brown;* New England, *C. Moore;* Clarence River, *Wilcox;* near Bulli, *Johnson.*

Victoria? Murray River, *F. Mueller.*

I do not quite identify this species with any extra Australian one, but it is very closely allied to *C. compressus*, which is common in tropical and subtropical regions. It is exceedingly variable in stature, in the degree of development of the inflorescence and in the number of flowers in the spikelets and consequently their shape. I have been unable to distribute the numerous forms before me into distinct varieties, but generally they may be placed in two series; one with long narrow spikelets and numerous flowers would include *C. aquatilis*, *C. imbecillis* and *C. trinervis*, Br., the other often a smaller or more slender plant, with broader shorter spikelets, fewer flowers and more spreading glumes would include *C. flaccidus*, *C. inundatus* and *C. breviculmis*. One of Cunningham's Endeavour River specimens looks at first sight very different, from the spikelets being only 1½ to 2 lines long and 1 line broad with 8 to 12 flowers. A few specimens from the interior of N. S. Wales have a more rigid aspect, and some from Rockhampton have remarkably long spikelets with numerous flowers. All have the same pale 3-nerved glumes, though the lateral nerve is sometimes scarcely prominent.

25. **C. Haspan,** *Linn.; Kunth, Enum.* ii. 34.—Stems tufted or shortly creeping, 6 in. to above 1 ft. rarely 2 ft. high, acutely 3-angled or flat but usually weak. Leaves all reduced to sheathing scales, or with a flat lamina shorter than the stem. Spikelets small, few together in loose clusters in a simple or compound umbel of slender usually numerous rays, the longest 2 to 3 in. long or sometimes all short. Involucral bracts 2 or 3, shorter than the inflorescence or one rather longer, flat and rather broad. Spikelets linear, flat, acute, 2 or at length 3 or even 4 lines long, scarcely ½ line broad, of 12 to 20 or rarely

more flowers, the rhachis not winged. Glumes appressed but loosely imbricate, narrow, obtuse, or with the prominent keel produced into a short point, the sides brown or pale, obscurely nerved, Stamens usually 3. Style 3-cleft. Nut obovoid or almost globular, obtusely 3-angled, less than half the length of the glume.—Rottb. Descr. et Ic. Pl. t. 6, f. 2 ; Bœckel. in Linnæa, xxxv. 574 ; F. Muell. Fragm. viii. 260 ; *Scirpus autumnalis*, Rottb. Descr. et Ic. Pl. 58, t. 17, f. 3, not of Linn. ; *Cyperus pulcherrimus*, Willd. ; Kunth, Enum. ii. 35 ; Bœckel. in Linnæa, xxxv. 573 ; *C. platyculmis*, R. Br. Prod. 214, altered to *C. laticulmis*, Spreng. Syst. i. 228.

N. Australia. Brunswick Bay, *A. Cunningham* ; Upper Victoria River and M'Adam Range, *F. Mueller* ; Port Darwin, *Schultz*, *n.* 310 ; islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Cape York, *Daemel*, *M'Gillivray* ; Lizard Island, *M'Gillivray* ; Rockingham Bay, *Dallachy* ; Rockhampton and neighbourhood, *Bowman* and others ; Moreton Bay, *F. Mueller*, *C. Stuart* and others.

N. S. Wales. Tweed River, *Eaves.*

Abundant in the tropical regions of the New and the Old World, replaced in S. Africa by the closely allied but evidently distinct *C. denudata*, *Linn.*, but extending northwards in America to Florida, New Orleans and Mexico.

26. **C. concinnus,** *R. Br. Prod.* 214.—Stems rather slender, from under 1 ft. to 1½ ft. high. Leaves narrow but sometimes as long as the stem. Spikelets in clusters of 3 or 4, in a compound umbel of numerous slender but rather short rays. Involucral bracts 3 or 4, very narrow, 1 or 2 of them longer than the inflorescence. Spikelets very flat, of a rich brown but bordered by the light-coloured tips of the glumes, ovate-oblong or at length oblong-linear, 2 to 3 or rarely 4 lines long, usually above 1 line broad, with 12 to 20 or rarely more flowers, the rhachis prominently notched but not winged. Glumes neatly imbricate, obtuse or almost acute, with prominent almost hyaline keels and margins, the sides otherwise dark brown with inconspicuous nerves, or rarely wholly hyaline and only appearing brown from the anthers showing through. Stamens 3 with short filaments. Style 3-cleft. Nut broadly triquetrous much less than half the length of the glume.—F. Muell. Fragm. viii. 261.

Queensland. Broad Sound and Shoalwater Bay, *R. Brown* ; Port Curtis, *Bowman*, *O'Shanesy* and others.

N. S. Wales. Northern interior near Mount Aiton, *A. Cunningham* ; Liverpool Plains, *C. Moore* ; New England, *C. Stuart.*

Victoria. Mount Hope, Snowy River and Creswick Creek, *F. Mueller.*

27. **C. filipes,** *Benth.*—Stems triquetrous, rigid, 1 to 3 ft high, leafless in the specimens seen except a single sheath at the base with a flat erect obtuse lamina of about 2 in. Spikelets single on the filiform rays of a compound umbel, the primary rays numerous mostly 4 to 8 in. long, one or two spikelets sessile or nearly so in the centre of the umbel. Involucral bracts about 8, mostly about as long as the rays and 2 or 3 lines broad, 1 or 2 short and narrow. Spikelets linear, flat,

3 to 5 lines long and scarcely 1 line broad, brown, 20- to 30-flowered, the rhachis prominently notched but not winged. Glumes rather broad, obtuse or shortly and obtusely acuminate, the keel not very prominent, the sides 3- or 4-nerved without nerveless margins, 4 or more of the lower ones usually smaller and empty. Stamens 3, on short filaments. Style 3-cleft. Nut ovoid-oblong, obtusely 3-angled or dorsally flattened, as long as or longer than the glume.

N. S. Wales. New England and Macleay River, *C. Moore*; Clarence River, *Wilcox*. Notwithstanding the long nut this species appears to be most nearly allied to the following.

28. **C. pedunculosus,** *F. Muell. Fragm.* viii. 266.—Stems rather stout, triquetrous, from about 6 in. to 1½ ft. high. Leaves few, longer than the stem, flat, 3 to 4 lines broad. Spikelets in clusters of about 3 or 4, in a simple or slightly compound umbel of 6 to 12 rays, the longest 3 to 8 in. long. Involucral bracts 5 or 6 or sometimes more, as broad as or broader than the stem-leaves, and 1 to 3 of them much longer than the inflorescence. Spikelets linear-lanceolate, flat, green or light brown, 4 to 9 lines long, 1½ lines broad, with about 20 to 30 flowers, the rhachis prominently notched but not winged. Glumes lanceolate, incurved, loosely but regularly imbricate, not spreading, the keel prominent, the sides nerveless or very faintly several-nerved. Stamens 3, with short filaments. Style 3-cleft. Nut broad, prominently 3-angled, much less than half the length of the glume.

Queensland. Rockingham Bay, *Dallachy*.

This and the preceding species have much the habit of the South American *C. simplex*, H. B. et K., but are both abundantly distinct in several respects.

29. **C. vaginatus,** *R. Br. Prod.* 213.—Stems from a horizontal or creeping rhizome, rigid, terete or slightly striate, 1 to 3 ft. high, leafless except a few brown sheaths at the base, the innermost of which sometimes 3 to 4 in. long with a short erect lamina. Spikelets numerous in dense globular heads of about ½ in. diameter when fully out, in a simple umbel of several often many rays of ½ to 1½ in. or the inflorescence contracted into a sessile compound cluster. Involucral bracts usually 5 or 6, more nearly equal than in any other species, erect or spreading, usually rigid, 1 to 3 in. long. Spikelets very flat, of a rich brown, oblong lanceolate or linear, about 1 line broad, varying from 2 to 3 lines long with 12 to 20 flowers to 4 to 6 lines with 40 to 50 flowers, the rhachis not winged. Glumes closely imbricate but spreading, acute, the keel prominent and pale coloured, the sides brown and nerveless. Stamens 2 to 3. Style 3-cleft. Nut very prominently 3-angled, rather broad, acute, less than half the length of the glume.—Bœckel. in Linnæa, xxxv. 572.

N. Australia. Nichol Bay, *Herb. F. Mueller*; lagoons, Flinders River, *F. Mueller*.

Queensland. Plains of the Condamine, *Leichhardt*; various localities in South Queensland, *O'Shanesy*, and others.

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